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User's Manual

Single Board Computer 3308050

Version 1.0, September 2006

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Glossary

AC ’97	Audio Codec 97
ACPI	Advanced Configuration and Power Interface
APM	Advanced Power Management
ARMD	ATAPI Removable Media Device
ASKIR	Shift Keyed Infrared
ATA	Advanced Technology Attachments
BIOS	Basic Input/Output System
CFII	Compact Flash Type 2
CMOS	Complementary Metal Oxide Semiconductor
CPU	Central Processing Unit
Codec	Compressor/Decompressor
COM	Serial Port
DAC	Digital to Analog Converter
DDR	Double Data Rate
DIMM	Dual Inline Memory Module
DIO	Digital Input/Output
DMA	Direct Memory Access
EIDE	Enhanced IDE
EIST	Enhanced Intel SpeedStep Technology
FDD	Floppy Disk Drive
FDC	Floppy Disk Connector
FFIO	Flexible File Input/Output
FIFO	First In/First Out
FSB	Front Side Bus
IrDA	Infrared Data Association
HDD	Hard Disk Drive
IDE	Integrated Data Electronics
I/O	Input/Output
ICH4	I/O Controller Hub 4
L1 Cache	Level 1 Cache
L2 Cache	Level 2 Cache
LCD	Liquid Crystal Display
LPT	Parallel Port Connector
LVDS	Low Voltage Differential Signaling
MAC	Media Access Controller
OS	Operating System
PCI	Peripheral Connect Interface
PIO	Programmed Input Output
PnP	Plug and Play
POST	Power On Self Test
RAM	Random Access Memory
SATA	Serial ATA
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology
SPD	Serial Presence Detect
S/PDI	Sony/Philips Digital Interface
SDRAM	Synchronous Dynamic Random Access Memory
SIR	Serial Infrared
UART	Universal Asynchronous Receiver-transmitter
USB	Universal Serial Bus
VGA	Video Graphics Adapter

Chapter

1

Introduction

1.1 3308050 Overview

The 5.25” 3308050 VIA LUKE single board computer (SBC) is fully equipped with advanced multi-mode I/Os. The 3308050 is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

1.1.1 3308050 Models

The 3308050 series has two models:

- 3308050A: 1GHz VIA LUKE CPU
- 3308050B: 533MHz VIA LUKE CPU

1.1.2 Optional 3907720 Daughterboard

The optional 3907720 daughterboard enables 18-bit or 24-bit LVDS connectivity.

1.1.3 3308050 Applications

The 3308050 is designed for applications in the following areas:

- Entertainment System:
  - Set-top-Box (STB)
  - Media Center
  - Home Theater
- Mission critical industrial platform:
  - Multi-Media / Dual Screen POS
  - Interactive KIOSK / Photo Kiosk
  - HMI / Panel PC
  - Automation & Security system.
- Mobile platform:
  - Car PC
  - Mobile/Portable Entertainment Device
  - Thin Client

1.1.4 3308050 Benefits

Some of the 3308050 benefits include:

- Flexible expansion capabilities:
  - PC/104-Plus
  - LVDS expansion daughter board
  - Dual 150MB/s SATA drive connectors
- Maximum graphics capabilities:
  - LVDS/CRT dual screen
  - 2D&3D integrated MPEG decoder
  - Wide screen display support
  - Multi-media capability
- Compact all in one solution providing:
  - Small Footprint design approach
  - Sufficient I/O support
  - Dual Screen support
  - Low heat generation
  - Fanless design

1.1.5 3308050 Features

Some of the 3308050 features are listed below:

- 5.25” form factor
- RoHS compliant
- Embedded 1GHz or 533MHz VIA LUKE processor
- Dual-independent display functionality
- Up to 1GB of 400MHz or 333MHz of DDR memory
- Two high performance gigabit Ethernet (GbE) controllers onboard
- Two SATA channels with transfer rates up to 150MB/s onboard
- Eight USB 2.0 devices onboard
- Integrated audio

1.2 3308050 Overview

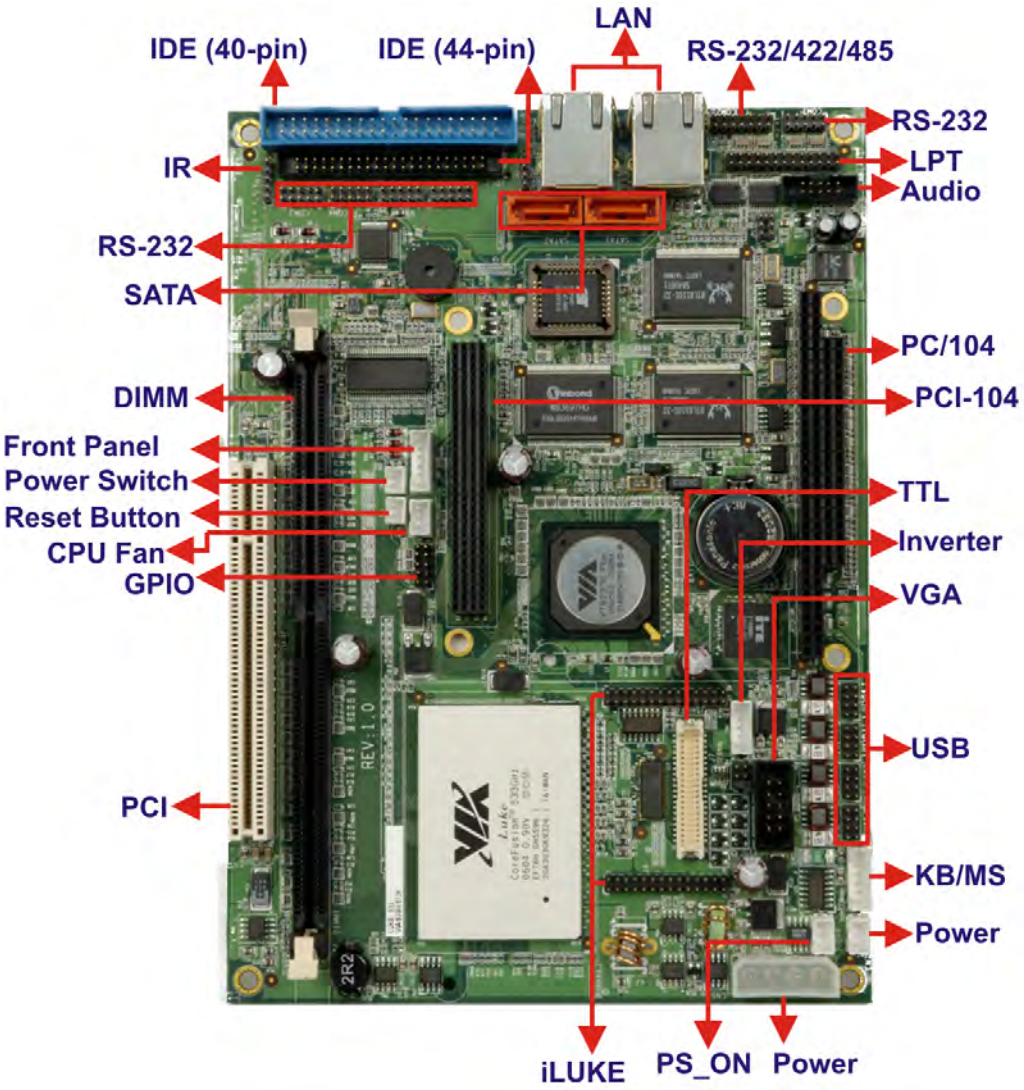

Figure 1-1: 3308050 Overview

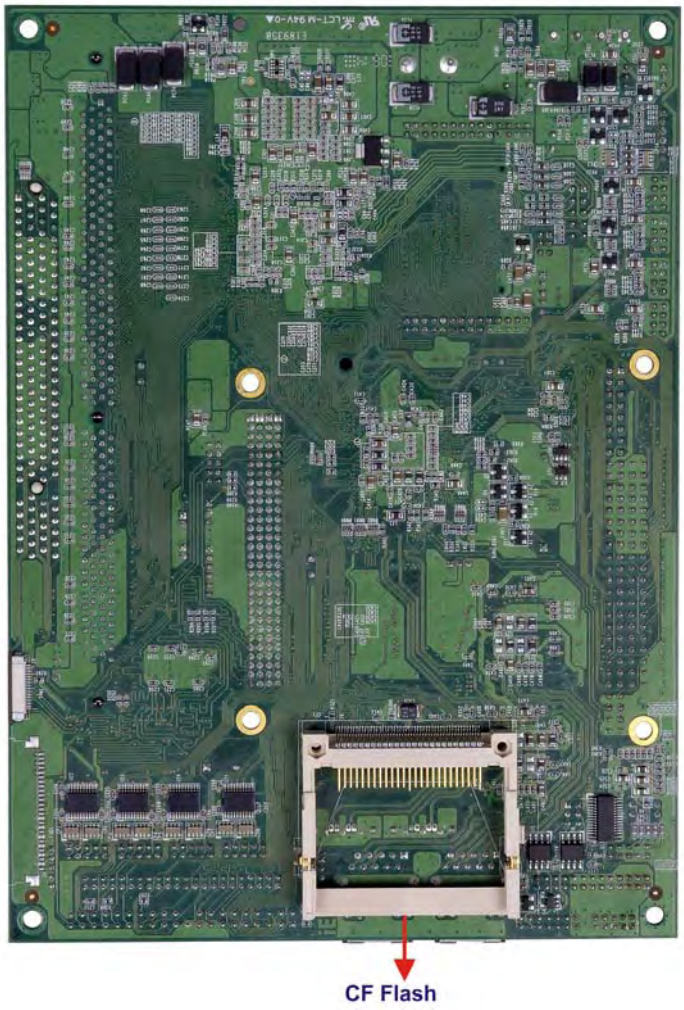

Figure 1-2: 3308050 Solder Side Overview

1.2.1 3308050 Connectors

The 3308050 has the following connectors onboard:

- 1 x ATX power connector
- 1 x AT power connector
- 1 x Audio connector
- 1 x CompactFlash (CF) connector (solder side)
- 1 x Fan connector
- 1 x Front panel connector
- 1 x General purpose input/output (GPIO) connector

- 2 x IDE Interface connectors (40-pin and 44-pin)
- 1 x Inverter power connector
- 1 x IR interface connector
- 1 x Keyboard/mouse connector
- 2 x LCD LVDS converter module connectors (connect to the daughterboard)
- 1 x PC/104-Plus connector (PCI interface)
- 2 x PC/104 connectors (ISA interface)
- 1 x PCI slot
- 1 x Parallel port connector
- 1 x Power switch connector
- 1 x Reset switch connector
- 1 x RS-232/485 serial port connector
- 5 x RS-232 serial port connectors
- 2 x SATA connectors
- 4 x USB connectors
- 1 x VGA connector

The 3308050 has the following connectors on the board rear panel:

- 2 x Ethernet connectors

The 3308050 has the following onboard jumpers:

- Clear CMOS
- CF card setup
- LCD voltage setup
- RS-232/485 COM2 setup
- RS-422/485 COM2 setup
- COM2 voltage setup

1.2.2 3907720 Daughterboard Connectors

Figure 1-3 shows the connectors on the front side of the 3907720 expansion daughterboard.

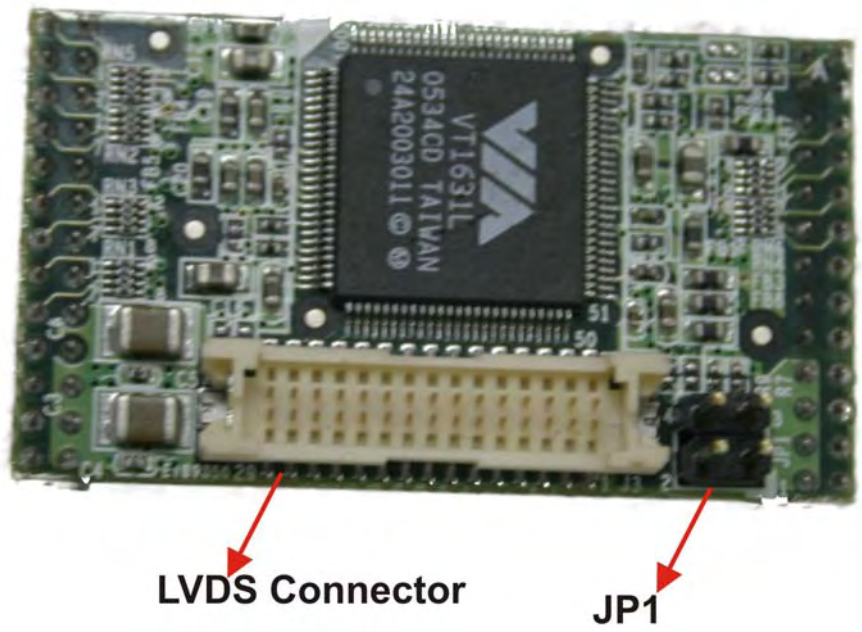

Figure 1-3: 3907720 Daughterboard Overview (Front Side)

The 3907720 has the following connectors onboard and accessible on the front side of the 3308050 (see **Figure 1-3**):

- 1 x LVDS connector

The 3907720 has one jumper (JP1) accessible on the front side (see **Figure 1-3**). The jumper is used to set single or dual channels for the LVDS display.

1.3 Technical Specifications

1.3.1 3308050 Specifications

3308050 technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2 Detailed Specifications**.

Specification	3308050
Form Factor	5.25” form factor
CPU	Embedded 1GHz VIA LUKE Embedded 533MHz VIA LUKE
System Chipset	VIA VT8237R+
Display	CRT integrated in VIA LUKE
Memory	Supports one 400MHz or 333MHz 184-pin DDR DIMM module with a maximum capacity of 1GB
BIOS	AMI BIOS Label
SSD	Compact Flash (CF)
Super I/O	W83697HG
Audio	AC'97 Codec Realtek ALC655
LAN	Dual RTL8110S
COM	Five RS-232C One RS-232/422/485
USB2.0	Four USB 1.1 or 2.0 onboard connectors support two devices each
IDE	One 40-pin and one 44-pin IDE each connects to two Ultra ATA33/66/100/133 IDE devices
Parallel Port	One LPT port connector

SATA	Two SATA connectors with transfer rates up to 150MB/sec
KB/MS	One PS/2 connector
WDT	Software programmable 1-255 sec. by supper I/O
IrDA	SIR / ASKIR
Digital I/O	8-bit digital IO (4 input / 4 output) by super I/O
Fan connector	One CPU Fan
Expansion	One PC/104-Plus interface One PCI slot
Power	+5V or +12V AT or ATX support
Temperature	0ºC - 60ºC
Humidity	5%~95% non-condensing
Dimensions	146.05mm x 203.2mm
Weight (GW/NW)	1100g/500g

Table 1-1: Technical Specifications

1.3.2 Optional 3907720 Daughterboard Technical Specifications

3907720 technical specifications are listed in **Table 1-2**. Detailed descriptions of each specification can be found in **Chapter 2 Detailed Specifications**.

Specification	POM-121IB
Chipset	VIA VT1631L
Display Connector	LVDS

Table 1-2: 3907720 Technical Specifications

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Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and onboard features of the 3308050 in detail.

2.2 Board Dimensions

The dimensions of the board are listed below and shown in **Figure 2-1**:

- **Length**: 203.2mm
- **Width**: 146.05mm

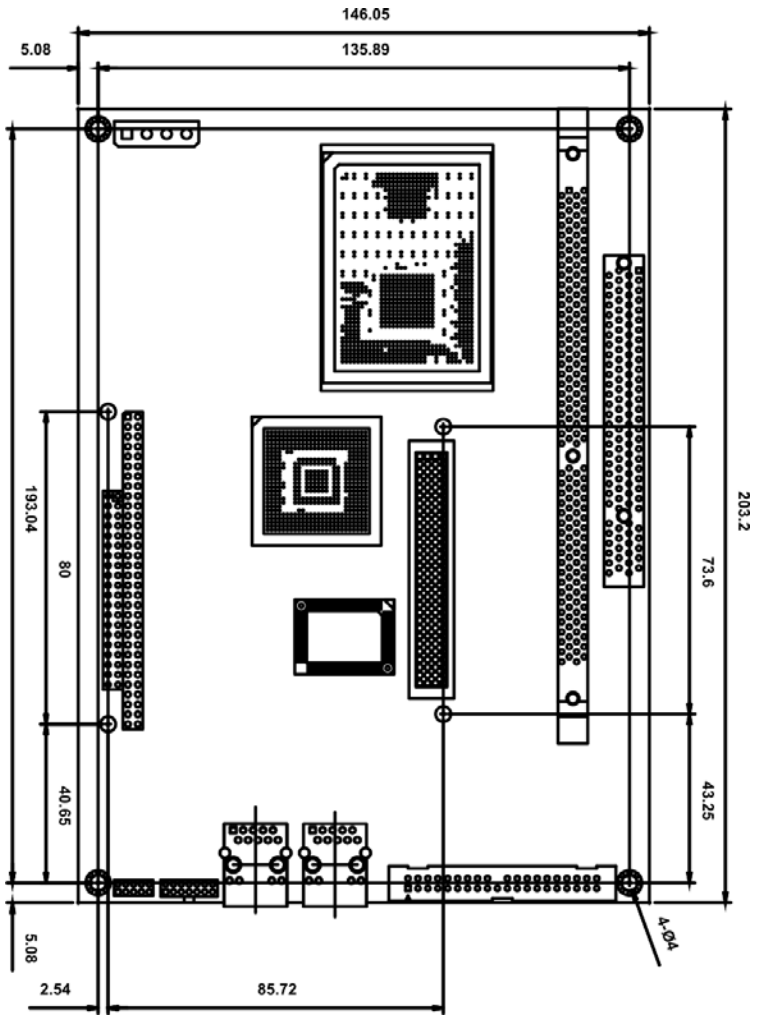

Figure 2-1: 3308050 Dimension (mm)

The external interface connector panel dimensions are shown in **Figure 2-2**.

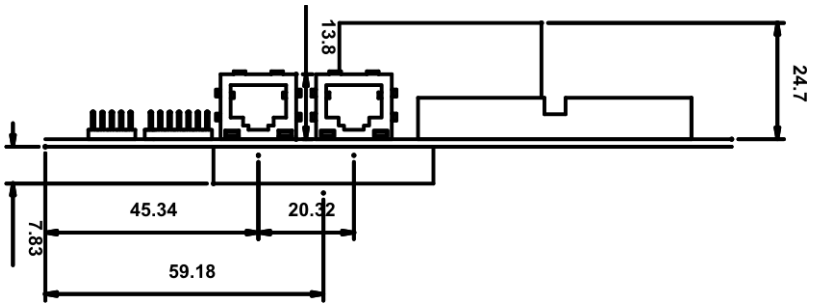

Figure 2-2: 3308050 External Interface Connector Dimensions (mm)

2.3 CPU Support

The 3308050 motherboard comes with a preinstalled 1GHz or 533MHz, ultra low voltage (ULV) VIA® Luke processor. The new VIA 'Luke' CoreFusion Processing Platform integrates the latest generation VIA Eden-N™ processor with the VIA CN400 Northbridge in a single, low power package.

The Luke CoreFusion processor features include the following:

- **Rich Integration**:- Highly integrated processing and digital media corelogic combination delivers leading performance in a single, power-efficient, space-saving package
- **S3 Graphics Unichrome Pro Graphics Core**:- With an internal data flow equivalent to what is available to the latest AGP 8X graphics cards, Unichrome Pro has separate 128-bit data path between the Northbridge for pixel data flow and texture/command access. Separate 128-bit 2D and 3D graphics engines ensure optimal performance for all multimedia, entertainment, and productivity applications.
- **Flawless Digital Media Playback**:- Unichrome Pro includes native support for the most popular digital video and audio playback through hardware MPEG-2/-4 acceleration and acclaimed VIA Vinyl Audio suite, delivering spectacular playback for entertainment devices.
- **Maximum Display Flexibility**:- Unichrome Pro with its optimized shared memory architecture and high definition video support through the

Chromotion CE Video Display Engine, offers a breathtaking visual experience for the latest HDTV format displays. Support for LVDS and DVI interfaces enables complete flexibility for integration into a wide range of embedded and personal electronics applications

- **Native Serial ATA**:- The VIA DriveStaion™ Controller Suite with native dual channel Serial ATA controller provides direct support for two 150MB/s Serial ATA devices and the SATAlite™ interface expands support for two additional SATA devices.

2.4 System Chipset

The 3308050 motherboard has a VIA VT8237R Plus Southbridge onboard. A summary of the available Southbridge features is listed below. For more information on this chipset please visit the VIA website.

- VIA DriveStation™ Controller Suite
  - Serial ATA
    - *Full duplex high performance 150MB/s Dual Channel Serial ATA interface*
    - *Support for additional two Serial ATA devices through SATALite™ interface*
  - Parallel ATA 133
    - *Supports up to four PATA devices*
- VIA Advanced Connectivity Suite
  - USB 2.0 Controller
  - Support for 8 USB 2.0/1.1 ports
    - *Network Controller*
  - Enterprise Class 10/100Mbps Fast Ethernet MAC
    - *PCI & LPC bus controllers*
- VIA Vinyl™ Audio
  - VIA Vinyl integrated 5.1 surround sound
    - *AC '97 audio*
    - *VIA Six-TRAC codec*
  - VIA Vinyl Gold onboard 7.1 surround sound
    - *24/96 resolution audio*
    - *VIA Envy24PT + VIA Six-TRAC Codec + additional DAC*
  - VIA Stylus Audio drivers
    - *Integrated Sensaura technology*

- *Full 3D gaming support*

- V-MAP Architecture
  - Ultra V-Link
    - *High throughput 1GB/s South Bridge/North Bridge interconnect*
    - *Supports new generation VIA North Bridges across all processor platforms*
  - 8X V-Link
    - *High speed 533MB/s South Bridge/North Bridge interconnect*
    - *Supports current generation VIA North Bridges across all processor platforms*
  - VIA Hyperion 4in1 Unified Drivers
    - *Optimized system performance and stability*

2.5 Data Flow

Figure 2-3 shows the data flow between the two onboard chipsets and other components installed on the motherboard and described in the following sections of this chapter.

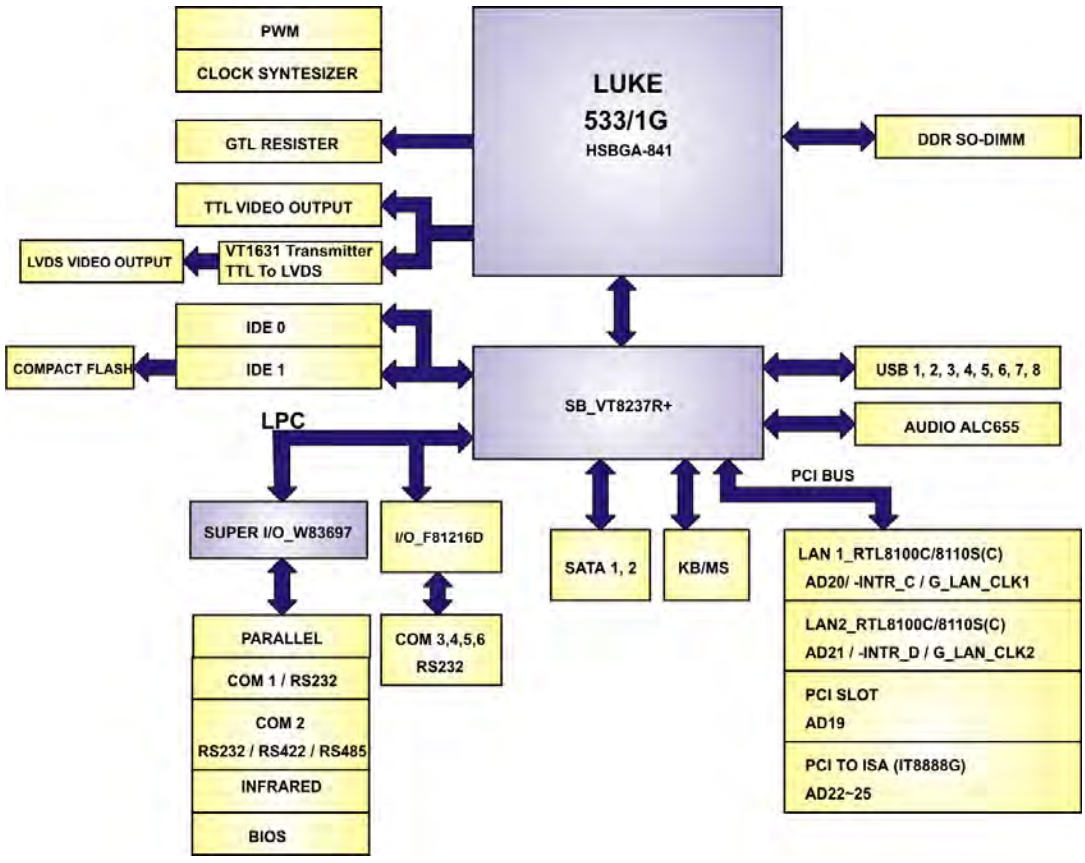

Figure 2-3: Data Flow Block Diagram

2.6 Graphics Support

The LUKE processor comes with a S3 Chromotion graphics engine. The features listed below are compatible with S3 Graphics' Chrome S20 Series processors:

- Chromotion Video Acceleration:-
  - **WMV9 Motion Compensation H/W Acceleration** – *Reduces CPU utilization when decoding Windows Media Video 9 (WMV9) files.*
  - **MPEG-2 IDCT and Motion Compensation H/W Acceleration** – *Reduces CPU utilization when decoding MPEG2 files.*
- Chromotion Hi-Def™ Support:-
  - **HDTV Formats** – *Supports all 18 DTV ATSC formats.*
  - **Adaptive Per-Pixel De-Interlacing** – *Produces superior image quality for both still and motion images using a high quality De-Interlacing process.*
  - **Video Deblocking** – *Removes blocking artifacts inherent in low bit rate images.*
  - **ChromoVision** – *Displays full screen video on secondary HDTV display while a windows display of the video is on the primary CRT or DVI display.*
  - **ChromoVision Modes with ChromeView Non-Linear Scaling** – *Scales a standard 4:3 image to fill a wide-screen 16:9 display with excellent image quality.*
  - **PanelDrive** – *Eliminates blurring effects with motion video on panel displays by increasing panel response time.*
  - **ChromoColor** – *Provides adjustment controls for the brightness, contrast, hue and saturation of the display of video.*
- Chromotion Video Image Controls:-
  - **ChromoColor Tonal Adjustment** – *Allows fine-tuning of luma values for the video display with controls for black point and white point enhancement.*
  - **ArtisticLicense Effects** – *Allows high quality image enhancements; including Sharpening, Soft Focus, Embossing, and Neon Edge effects.*

2.7 Optional 3907720 LVDS Display Support

The 3308050 Motherboard supports LVDS displays. Using the 3907720 daughterboard enables connectivity to 18-bit or 24-bit flat panel displays. The 3907720 comes with an onboard VIA VT1631L Low Voltage Differential Signaling (LVDS) Transmitter. The VIA VT1631L is designed to support pixel data transmissions from a Host to a Flat Panel display ranging from VGA to UXGA resolutions. VIA VT1631 features are listed below.

- Complies with Open LDI Specification for Digital Display Interfaces
- 25 to 85 MHz Input Clock Support
- Supports VGA through UXGA Panel Resolution
- Power-down mode <198uW max (TBD)
- Two-wire Serial Communication Interface up to 400KHz
- Narrow Bus reduces cable size and cost
- Up to 4.76 Gbps bandwidth in dual 24-bit RGB into Dual Pixel Out applications
- Up to 592Mbytes/sec bandwidth
- Dual 12-bit double pumped digital input port
- PLL requires no external components
- Support both LVTTL and low voltage level input (Capable of 1.0 to 1.8V)
- Programmable input clock and control strobe select
- Compatible with TIA/EIA-644
- 2.24 to 2.75 supply voltage
- TQFP-100 Thin Quad Flat package

2.8 Memory Support

The 3308050 has one 184-pin dual inline memory module (DIMM) socket and supports one DDR DIMM with the following specifications:

- **Maximum RAM**: 1GB
- **DIMM Transfer Rates**: 400MHz or 333MHz

2.9 PCI Bus Interface Support

The PCI bus on the 3308050 Motherboard has the following features:

- 33MHz Revision 2.2 is implemented
- Maximum throughput: 133MB/sec
- One PCI REQ/GNT pair can be given higher arbitration priority (intended for external 1394 host controller)
- 64-bit addressing supported

2.10 Ethernet Controller

2.10.1 Introduction

The Realtek RTL8110S Ethernet controller combines a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, 32-bit PCI bus controller, and embedded memory. The device supports the PCI v2.2 bus interface for host communications with power management, and is compliant with the IEEE 802.3 specification for 10/100Mbps Ethernet and the IEEE 802.3ab specification for 1000Mbps Ethernet. It also supports an auxiliary power auto-detect function, and will auto-configure related bits of the PCI power management registers in PCI configuration space.

2.10.2 Realtek RTL8110S Features

Realtek RTL8110S features are listed below

- Integrated 10/100/1000 transceiver
- Auto-Negotiation with Next page capability
- Supports PCI 2.2, 32bit, 33/66MHz
- Supports pair swap/polarity/skew correction
- Crossover Detection & Auto-Correction
- Wake-on-LAN and remote wake-up support
- Microsoft® NDIS5 Checksum Offload (IP, TCP, UDP) and largesend offload support
- Supports Full Duplex flow control (IEEE 802.3x)
- Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab
- Supports IEEE 802.1Q VLAN tagging
- Serial EEPROM
- 3.3V signaling, 5V PCI I/O tolerant
- Transmit/Receive FIFO (8K/64K) support
- Supports power down/link down power saving

- JTAG support
- Supports PCI Clock Run Pin
- 128-pin QFP
-

2.11 Drive Interfaces

The 3308050 can support the following drive interfaces.

- 2 x SATA drives
- 2 x IDE devices
- 1 x CF Type 2 card

2.11.1 SATA Drives

The 3308050 supports two, first generation SATA drives with transfer rates of up to 150MB/s

2.11.2 IDE HDD Interfaces

The 3308050 southbridge chipset IDE controller supports up to four HDDs with the following specifications:

- Supports PIO IDE transfers up to 16MB/s
- Supports Ultra ATA/133 devices with data transfer rates up to 133MB/s

2.11.3 Compact Flash Support

A standard 3.3mm thick CF Type I or 5mm thick CF Type II card can be inserted into the CompactFlash® slot on the 3308050 PCB. CompactFlash® cards with data rates up to 66MB/sec and capacities up to 137GB are supported.

2.12 Serial Ports

The 3308050 has six high-speed UART serial ports, configured as COM1, COM2, COM3, COM4, COM5 and COM6. The serial ports have the following specifications.

- 16C550 UART with 16-byte FIFO buffer
- 115.2Kbps transmission rate

COM2 can be configured as RS-232, RS-424 or RS-485. COM2 can also be configured as an infrared interface.

2.13 Real Time Clock

256-byte battery backed CMOS RAM

2.14 System Monitoring

The 3308050 is capable of self-monitoring various aspects of its operating status including:

- CPU, chipset, and battery voltage, +3.3V, +5V, and +12V
- RPM of cooling fans
- CPU and board temperatures (by the corresponding embedded sensors)

2.15 Infrared Data Association (IrDA) Interface

The 3308050 IrDA supports the following interfaces.

- Serial Infrared (SIR)
- Shift Keyed Infrared (ASKIR)

If an IrDA port is need, COM2 must be configured as either SIR or ASKIR mode in the BIOS under **Super IO devices**. Normal RS-232 COM 2 is then disabled.

2.16 USB Interfaces

The 3308050 supports eight USB 2.0 or USB 1.1 devices. Two are connected externally and the remaining six internally.

2.17 BIOS

The 3308050 uses a licensed copy of AMI BIOS. The features of the flash BIOS used are listed below:

- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (**P**re-Boot E**x**ecution **E**nvironment) support

- USB booting support

2.18 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the 3308050 are listed below.

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

A heat sink must always be installed on the CPU when the system is run. A cooling fan may or may not be required depending on the CPU being used.

2.19 Audio Codec

The 3308050 has an integrated REALTEK ALC655 CODEC. The ALC655 CODEC is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs. Some of the features of the codec are listed below.

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
- Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
- 14.318MHz -> 24.576MHz PLL to eliminate crystal
- 12.288MHz BITCLK input
- Integrated PCBEEP generator to save buzzer
- Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX
- High-quality differential CD input
- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)
- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output

- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-pin LQFP package
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D positional audio
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

2.20 Power Consumption

Table 2-1 shows the power consumption parameters for the 3308050A when a 1GHz VIA LUKE processor is mounted on the board and 1GB of 400MHz DDR SDRAM is used.

Voltage	Current
+5V	4.74A
+12V	0.02A
+5VSB	0.07A

Table 2-1: Power Consumption 1

Table 2-2 shows the power consumption parameters for the 3308050B when a 533MHz VIA LUKE processor is mounted on the board and 1GB of 400MHz DDR SDRAM is used.

Voltage	Current
+5V	3.89A
+12V	0.02A
+5VSB	0.07A

Table 2-2: Power Consumption 2

2.21 Packaged Contents and Optional Accessory Items

2.21.1 Package Contents

The 3308050 is shipped with the following components.

- 1x 3308050 single board computer
- 1 x ATA 66/100 flat cable
- 2 x SATA cables
- 1 x SATA power cable
- 3 x Single RS-232 cables
- 1 x RS-232/422/485 cable
- 1 x KB/MS cable
- 1 x VGA cable
- 1 x USB cable
- 1 x Audio cable
- 1 x Mini jumper pack
- 1x Utility CD
- 1x Quick Installation Guide

2.21.2 Optional Accessory Items

The items shown in the list below are optional accessory items are purchased separately.

- LVDS function daughterboard
- ATX power cable
- LPT cable

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Chapter

3

Connectors and Jumpers

3.1 Peripheral Interface Connectors

Section 3.1.1 shows peripheral interface connector locations. **Section 3.1.2** lists all the peripheral interface connectors seen in **Section 3.1.1**.

3.1.1 3308050 Layout

Figure 3-1 shows the onboard peripheral connectors, rear panel peripheral connectors and onboard jumpers.

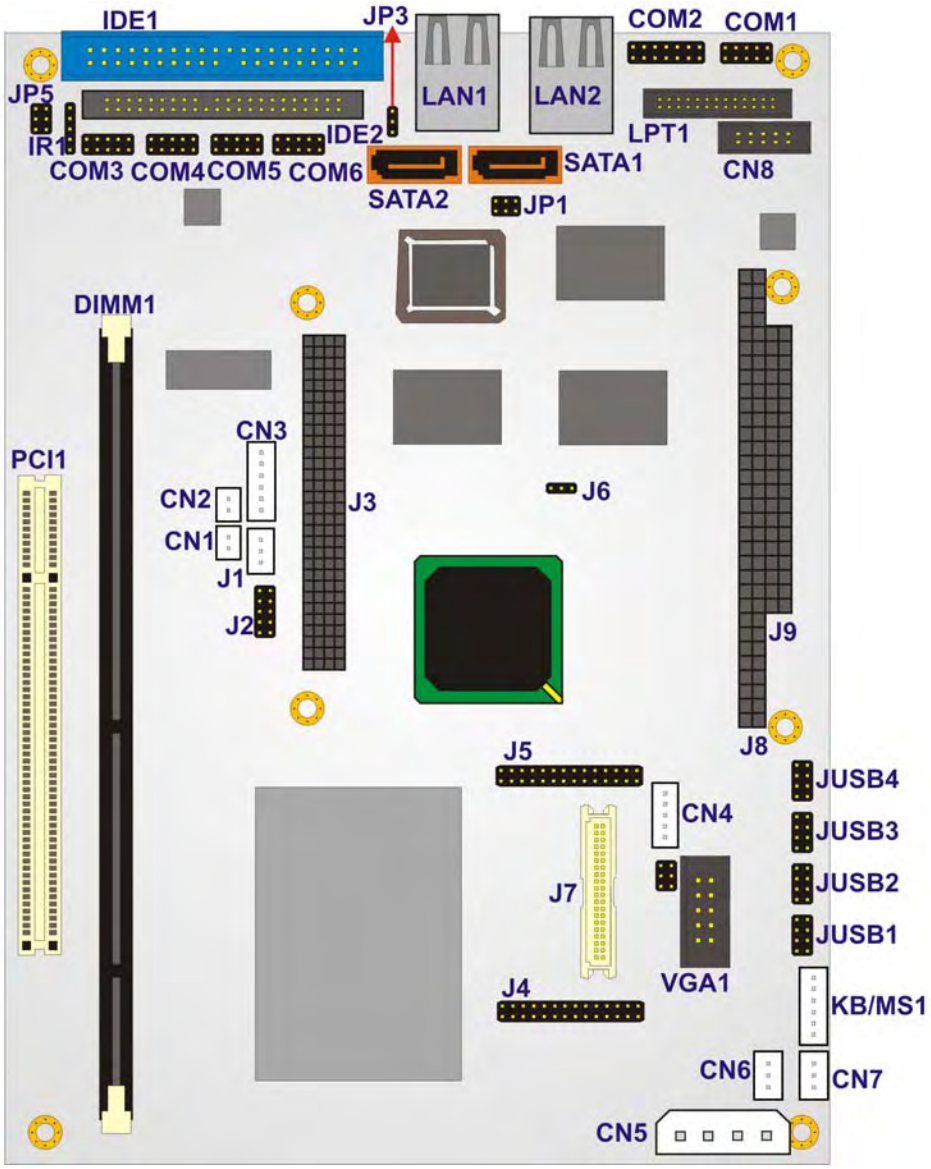


Figure 3-1: Connector and Jumper Locations

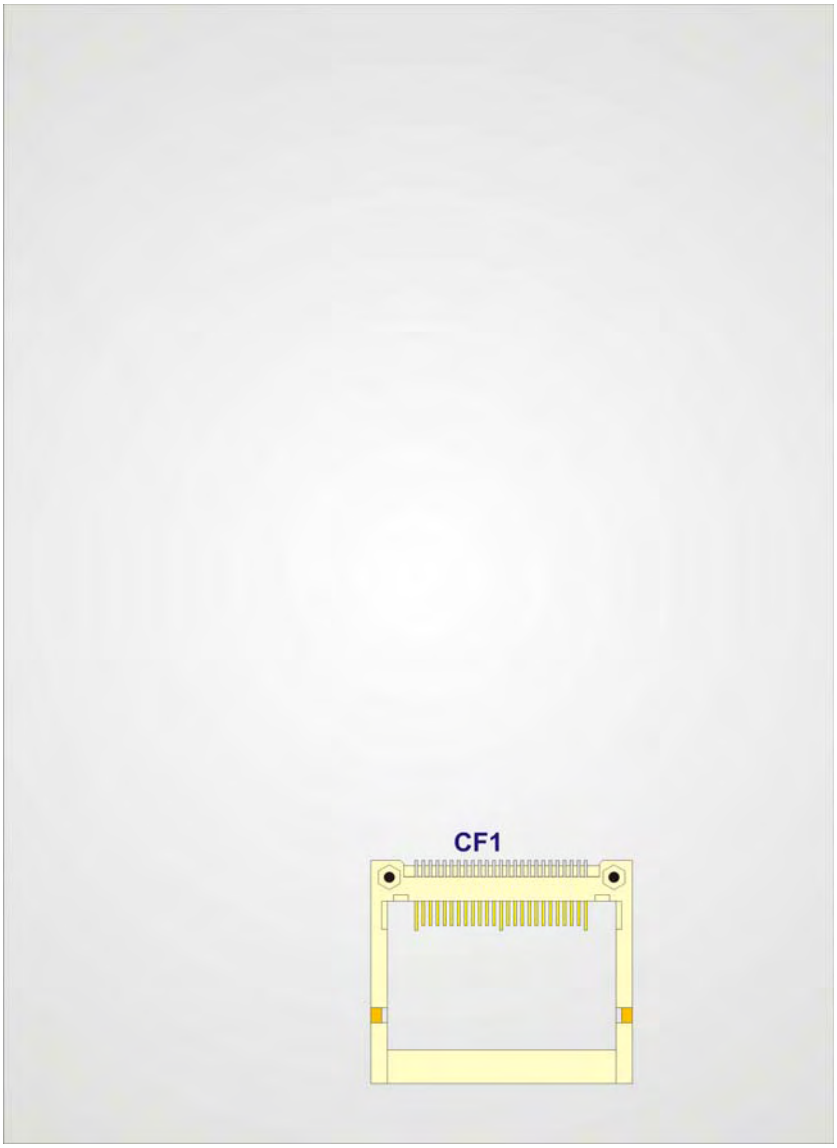


Figure 3-2: Connector and Jumper Locations (Solder Side)

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the 3308050. Detailed descriptions of these connectors can be found in **Section 3.1.3** on **page 43**.

Connector	Type	Label
+5VSB PS_ON connector	3-pin header	CN6
-12V power supply	3-pin header	CN7

AT power connector	4-pin header	CN5
Audio connector	10-pin header	CN8
Compact Flash (CF) connector	50-pin header	CF1
Fan connector	3-pin header	J1
Front panel connector	6-pin header	CN3
GPIO connector	10-pin header	J2
IDE Interface connector (Primary)	40-pin header	IDE1
IDE Interface connector (Secondary)	44-pin header	IDE2
Inverter Power connector	5-pin header	CN4
IR Interface connector	5-pin header	FIR1
Keyboard/Mouse connector	6-pin header	KB/MS1
LCD LVDS converter board connector	28-pin header	J4
LCD LVDS converter board connector	28-pin header	J5
Parallel port connector	26-pin header	LPT1
PC/104 (ISA interface)	104-pin slot	J8, J9
PCI-104 (PCI interface)	120-pin slot	J3
PCI slot	128-pin PCI slot	PCI1
Power switch	2-pin header	CN2
Reset switch	2-pin header	CN1
RS-232 serial port connector	10-pin header	COM1
RS-232/422/485 serial port connector	14-pin header	COM2
RS-232 serial port connector	10-pin header	COM3
RS-232 serial port connector	10-pin header	COM4
RS-232 serial port connector	10-pin header	COM5

RS-232 serial port connector	10-pin header	COM6
SATA drive connector (150MB/s)	7-pin SATA connector	SATA1
SATA drive connector (150MB/s)	7-pin SATA connector	SATA2
TTL connector	40-pin header	J7
USB connector (USB 1.1 and USB 2.0)	8-pin header	JUSB1
USB connector (USB 1.1 and USB 2.0)	8-pin header	JUSB2
USB connector (USB 1.1 and USB 2.0)	8-pin header	JUSB3
USB connector (USB 1.1 and USB 2.0)	8-pin header	JUSB4
VGA connector	10-pin header	VGA1

Table 3-1: Peripheral Interface Connectors

3.1.3 External Interface Panel Connectors

Table 3-2 lists the external interface connectors on the 3308050. Detailed descriptions of these connectors can be found in Section 3.3 on page 85.

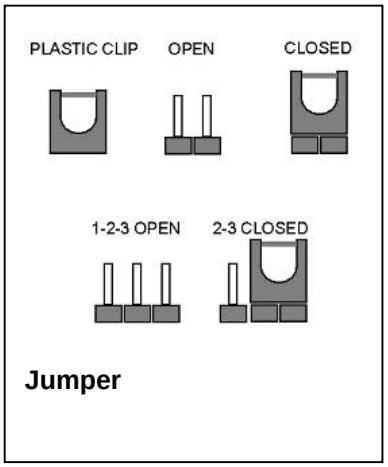
Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2

Table 3-2: External Interface Connectors

3.1.4 On-board Jumpers

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two 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.



Jumper

Table 3-3 lists the on-board jumpers. Detailed descriptions of these jumpers can be found in **Section 4.5**.

Description	Label	Type
Clear CMOS	J6	3-pin header
CompactFlash setup	JP3	3-pin header
LCD voltage setup	JP4	6-pin header
COM2 RS-232/RS-485 setup	JP1	3-pin header
COM2 RS-422/RS-485 setup	JP2	3-pin header
COM2 RS-232 Voltage setup	JP5	6-pin header

Table 3-3: On-board Jumpers

3.2 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 3308050.

3.2.1 +5VSB PS_ON

CN Label: **CN6**

CN Type: 3-pin header (1x3)

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

CN Pinouts: See **Table 3-5**

The PS_ON connector (CN6) connects to an ATX power supply.

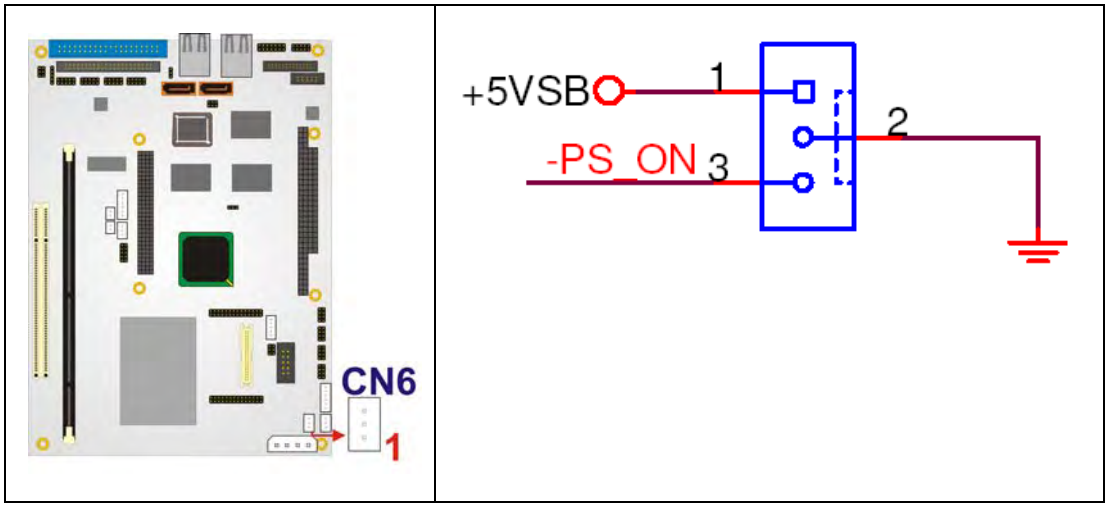


Figure 3-3: +5VSB PS_ON Connector Location

PIN NO.	DESCRIPTION
1	+5VSB
2	GND
3	-PS_ON

Table 3-4: +5VSB PS_ON Connector Pinouts

3.2.2 –12V Power Supply

CN Label: **CN7**

CN Type: 3-pin header (1x3)

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

CN Pinouts: See **Table 3-5**

The –12V power supply provides an additional power output connector for other applications.

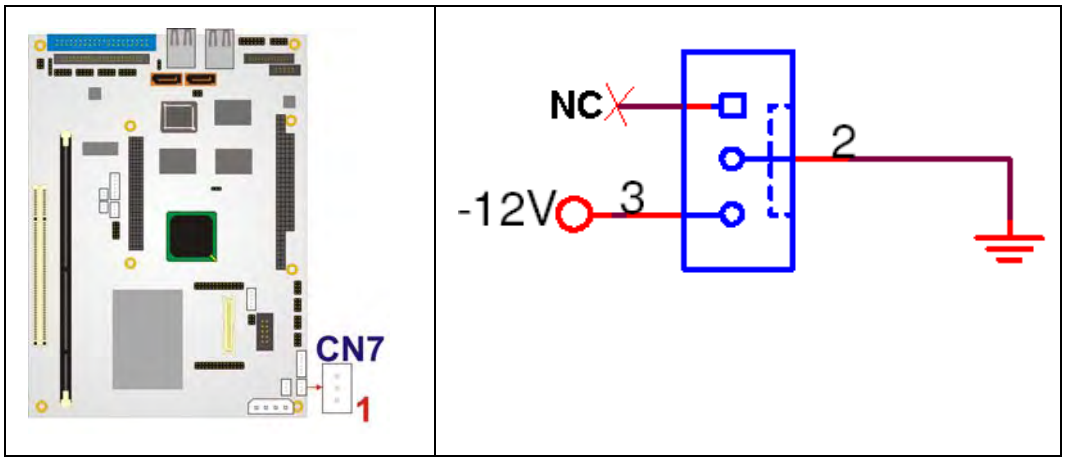


Figure 3-4: -12V Power Supply Connector Location

PIN NO.	DESCRIPTION
1	NC
2	GND
3	-12V

Table 3-5: -12V Power Supply Connector Pinouts

3.2.3 AT Power Connector

CN Label: **CN5**

CN Type: 4-pin ATX power connector (1x4)

CN Location: See **Figure 3-5**

CN Pinouts: See **Table 3-6**

The AT power connector is connected to an AT power source that powers the system.

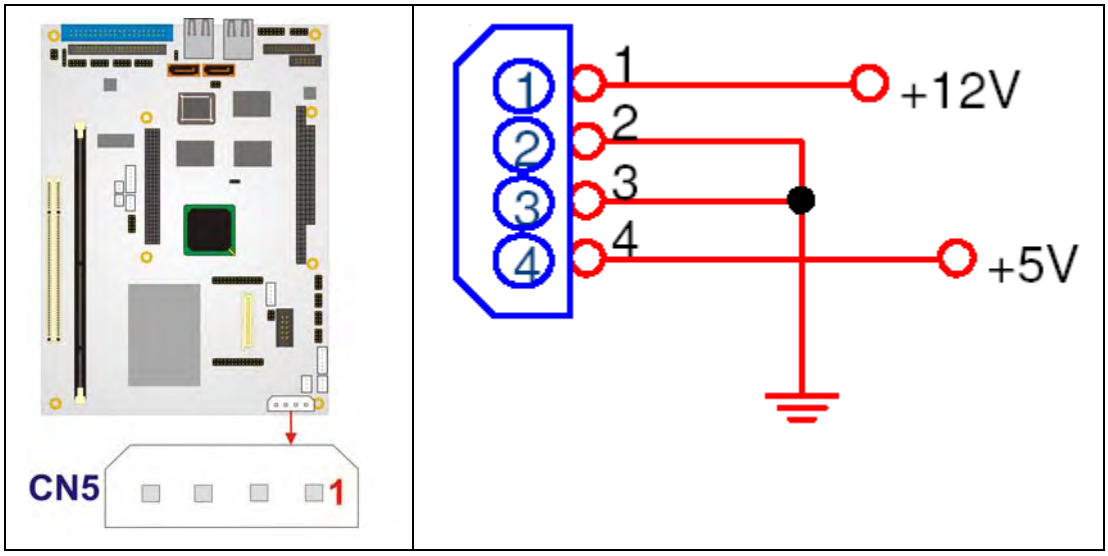


Figure 3-5: AT Power Connector Location

PIN NO.	DESCRIPTION
1	+12V
2	GND
3	GND
4	+5V

Table 3-6: ATX Power Connector Pinouts

3.2.4 Audio Connector

CN Label: **CN8**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-6**

CN Pinouts: See **Table 3-7**

The audio connector is connected to an onboard codec. An external audio connector kit can be connected to the connector to provide sound input and output.

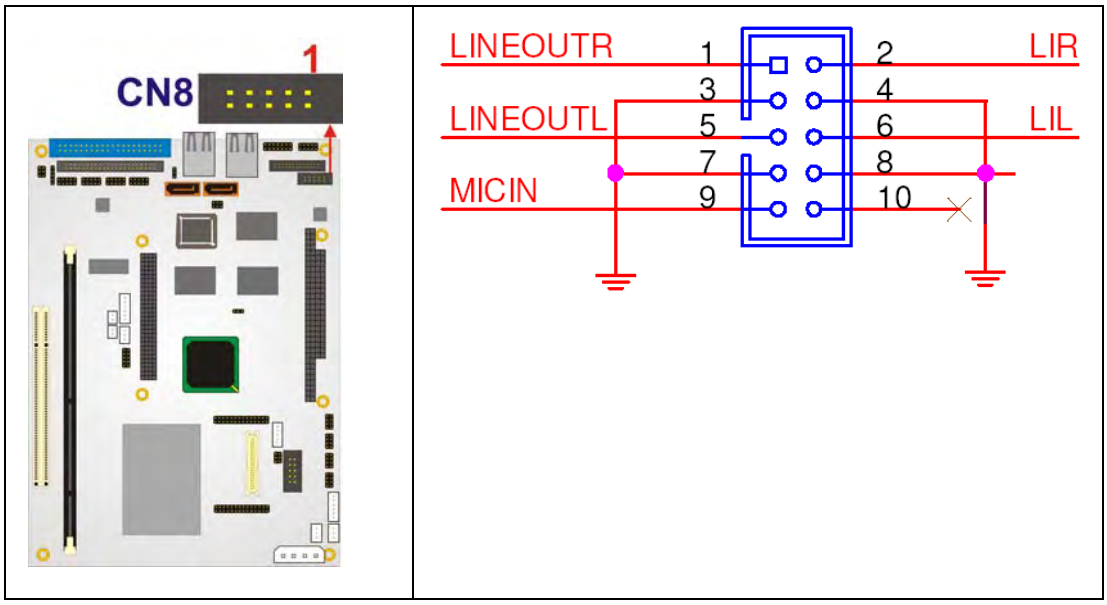


Figure 3-6: Audio Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Line Out R	2	Line In R
3	GND	4	GND
5	Line Out L	6	Line In L
7	GND	8	GND
9	MIC in	10	NC

Table 3-7: Audio Connector Pinouts

3.2.5 Compact Flash Connector

CN Label: **CF1** (solder side)

CN Type: 50-pin header (2x25)

CN Location: See **Figure 3-7**

CN Pinouts: See **Table 3-8**

A CompactFlash memory module is inserted to the CompactFlash 2 connector (CF1). Jumper 2 (JP2) configures the compact flash drive as either a slave or master device.

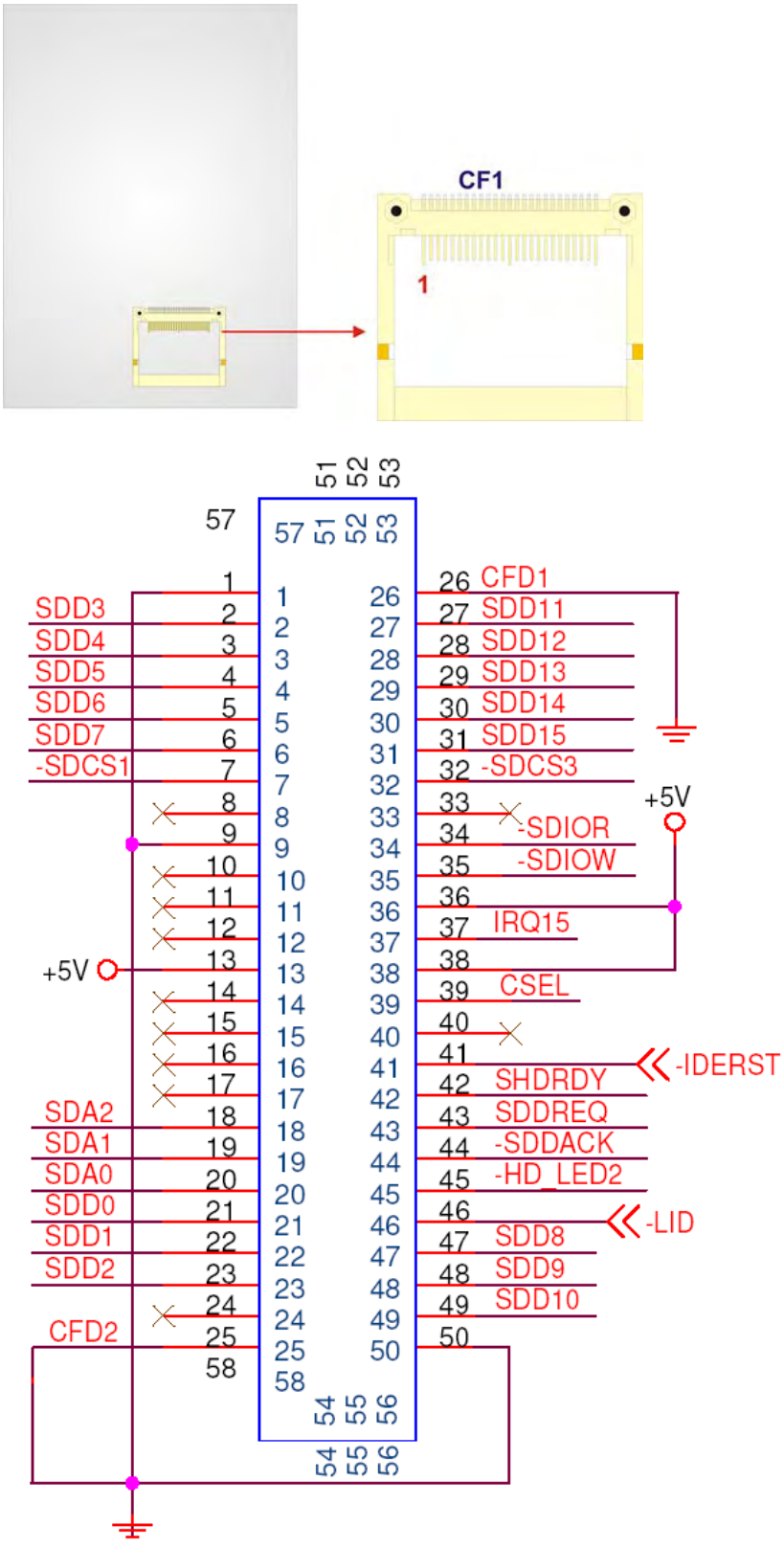


Figure 3-7: Compact Flash Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
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	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	VCC_COM
12	N/C	37	IRQ15
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-8: Compact Flash Connector Pinouts

3.2.6 Fan Connector

CN Label: **J1**

CN Type: 3-pin header

CN Location: See **Figure 3-8**

CN Pinouts: See **Table 3-9**

The cooling fan connector provides a 5V, 500mA current to a system 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.

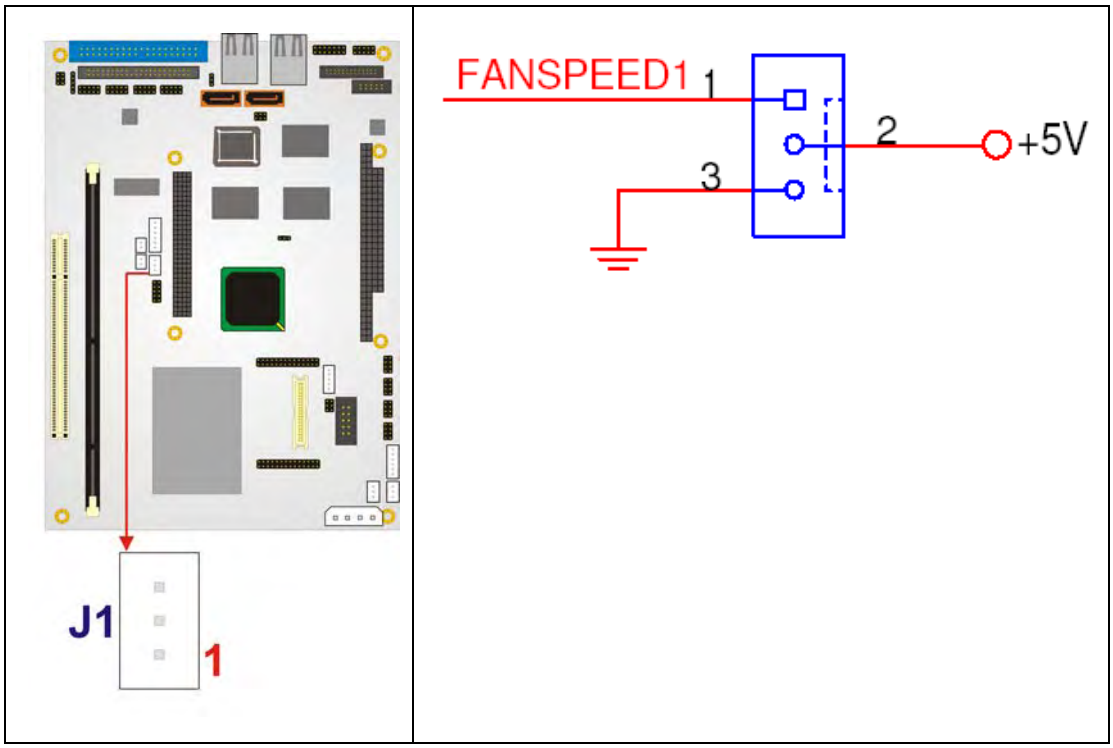


Figure 3-8: Fan Connector Location

PIN NO.	DESCRIPTION
1	Fan Speed Detect
2	+5V
3	GND

Table 3-9: Fan Connector Pinouts

3.2.7 Front Panel Connector

CN Label: **CN3**

CN Type: 6-pin header (1x6)

CN Location: See **Figure 3-9**

CN Pinouts: See **Table 3-10**

The front panel connector (CN1) connects to a power LED and an HDD LED to indicate the on/off status of the system and show activity on the HDD.

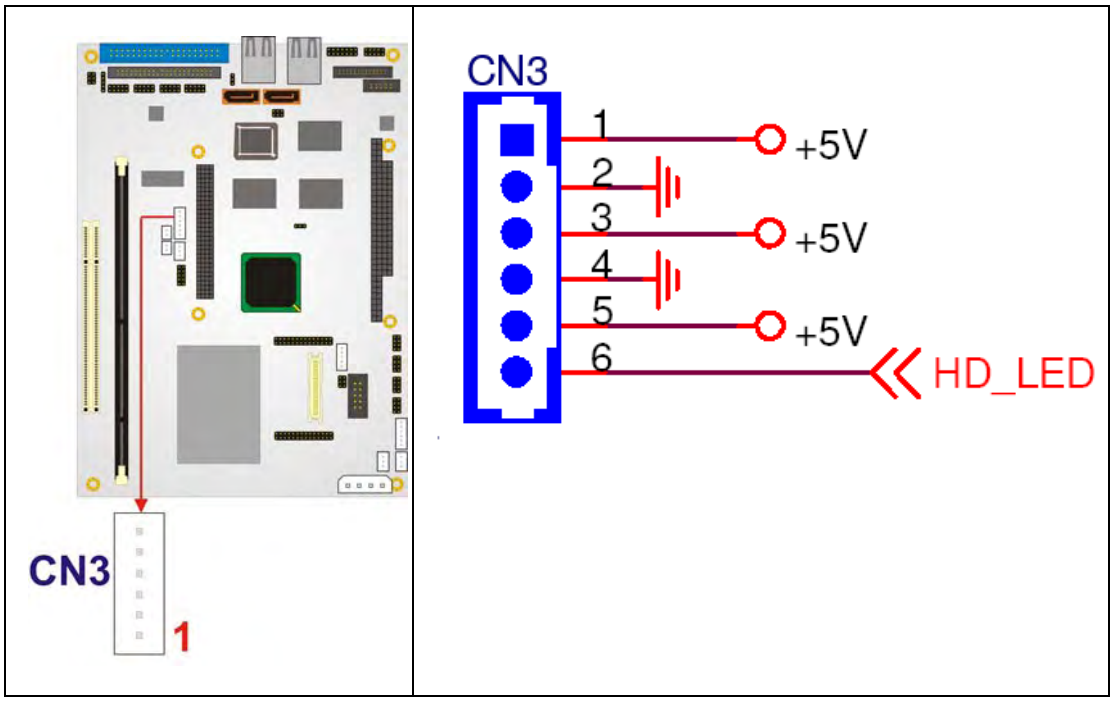


Figure 3-9: Front Panel Connector Locations

Pin No.	Description
1	N/C
2	N/C
3	Power LED +
4	Power LED -
5	HDD LED+

6	HDD LED-

Table 3-10: Front Panel Connector Pinouts

3.2.8 GPIO Connector

CN Label: **J2**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-10**

CN Pinouts: See **Table 3-11**

The General Purpose Input Output (GPIO) connector can be connected to external I/O control devices including sensors, lights, alarms and switches.

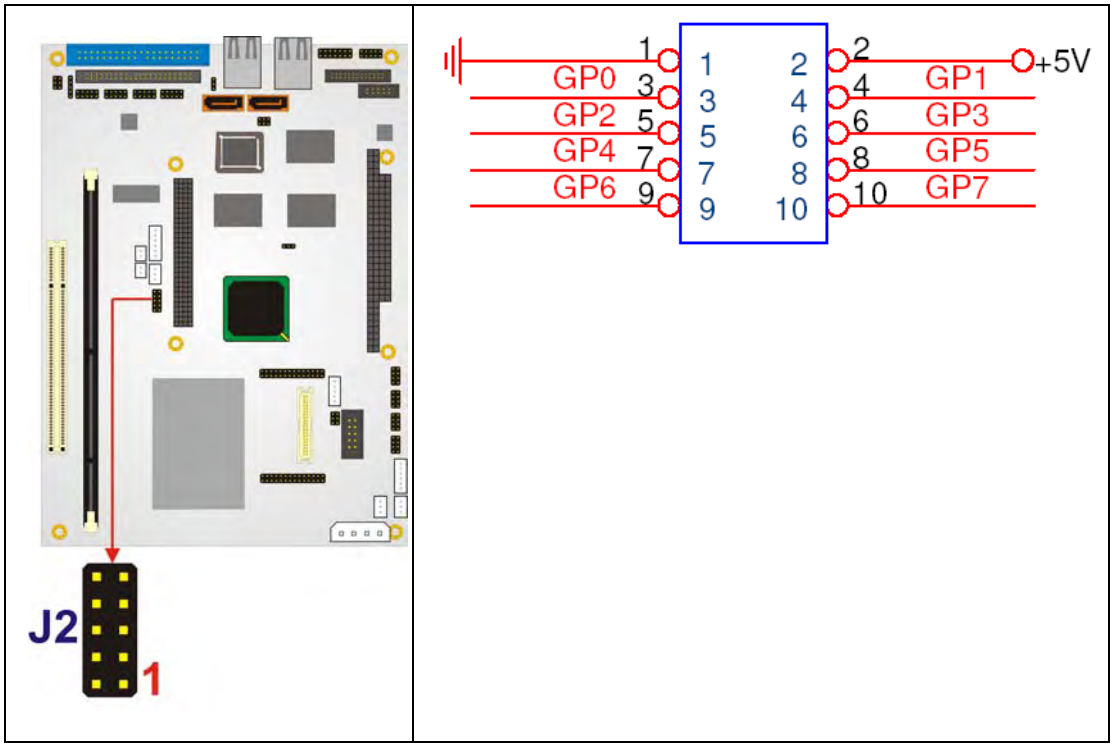


Figure 3-10: GPIO Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	+5V
3	GP0	4	GP1

5	GP2	6	GP3
7	GP4	8	GP5
9	GP6	10	GP7

Table 3-11: GPIO Connector Pinouts

3.2.9 IDE Connector (Primary)

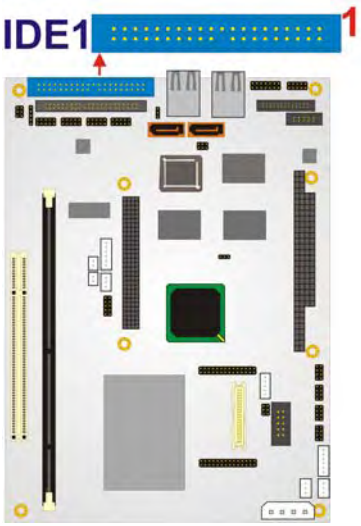
CN Label: **IDE1**

CN Type: 40-pin header (2x20)

CN Location: See **Figure 3-11**

CN Pinouts: See **Table 3-12**

One primary 40-pin primary IDE device connector on the 3308050 motherboard supports connectivity to Ultra ATA/33/66/100 IDE devices with data transfer rates up to 133MB/s.



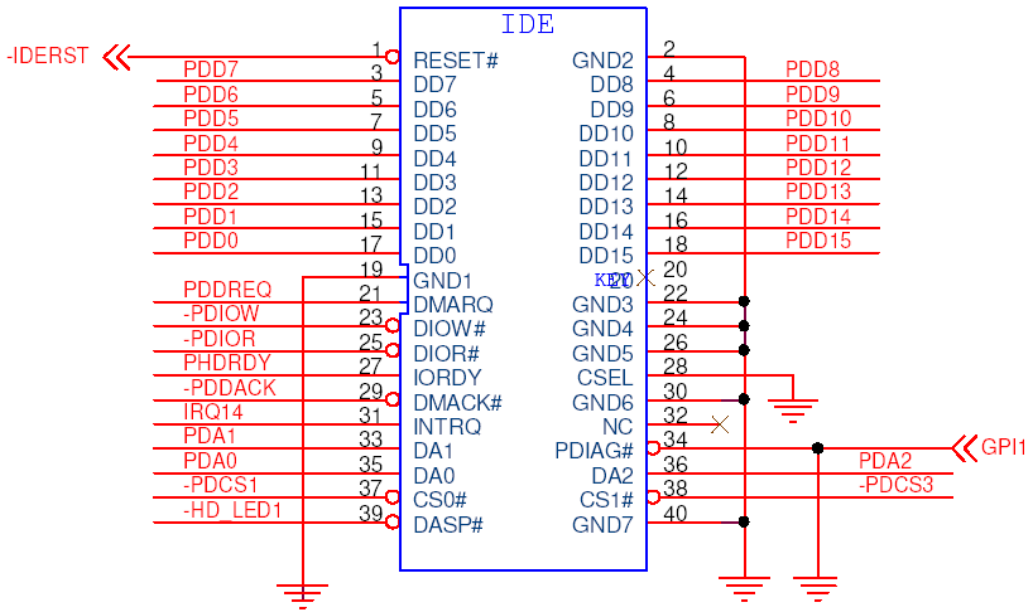


Figure 3-11: Primary IDE Device Connector Locations

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	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2

37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND

Table 3-12: Primary IDE Connector Pinouts

3.2.10 IDE Connector (Secondary)

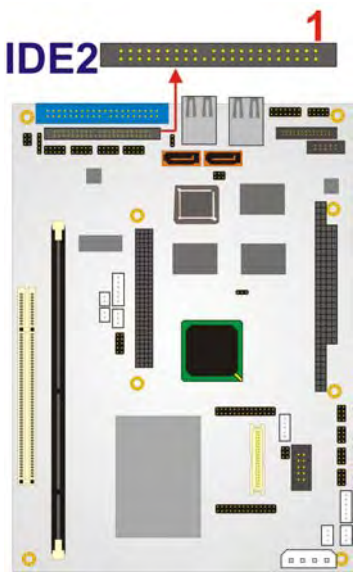
CN Label: **IDE2**

CN Type: 44pin header (2x22)

CN Location: See **Figure 3-12**

CN Pinouts: See **Table 3-13**

One 44-pin secondary IDE device connector on the 3308050 motherboard supports connectivity to Ultra ATA/33/66/100 IDE devices with data transfer rates up to 133MB/s.



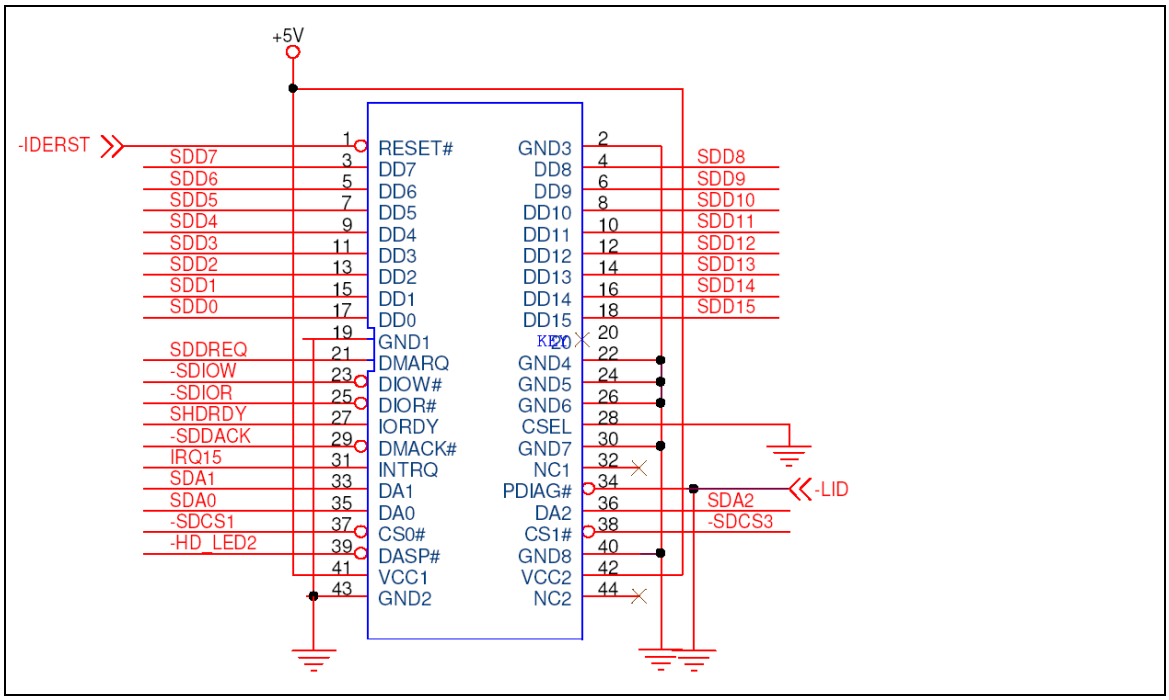


Figure 3-12: Secondary IDE Device Connector Locations

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	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C

35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

Table 3-13: Secondary IDE Connector Pinouts

3.2.11 Inverter Power Connector

CN Label: **CN4**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 3-13**

CN Pinouts: See **Table 3-14**

The inverter connector is connected to the LCD backlight.

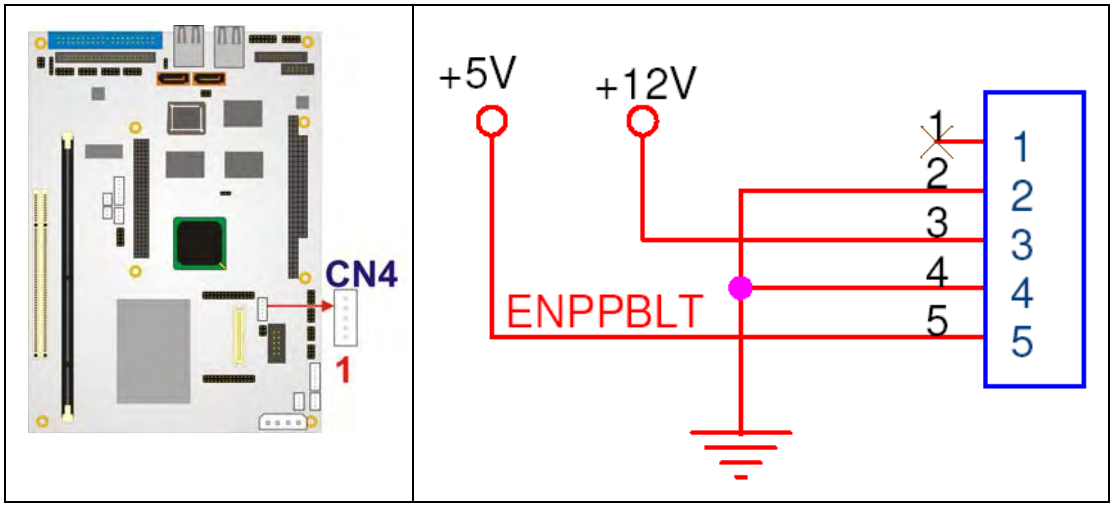


Figure 3-13: Inverter Connector Locations

PIN NO.	DESCRIPTION
1	NC
2	GND
3	+12V

4	GND
5	ENPPBLT (+5V)

Table 3-14: Inverter Power Connector Pinouts

3.2.12 IR Interface Connector

CN Label: **IR1**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 3-14**

CN Pinouts: See **Table 3-15**

The integrated infrared (IrDA) connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

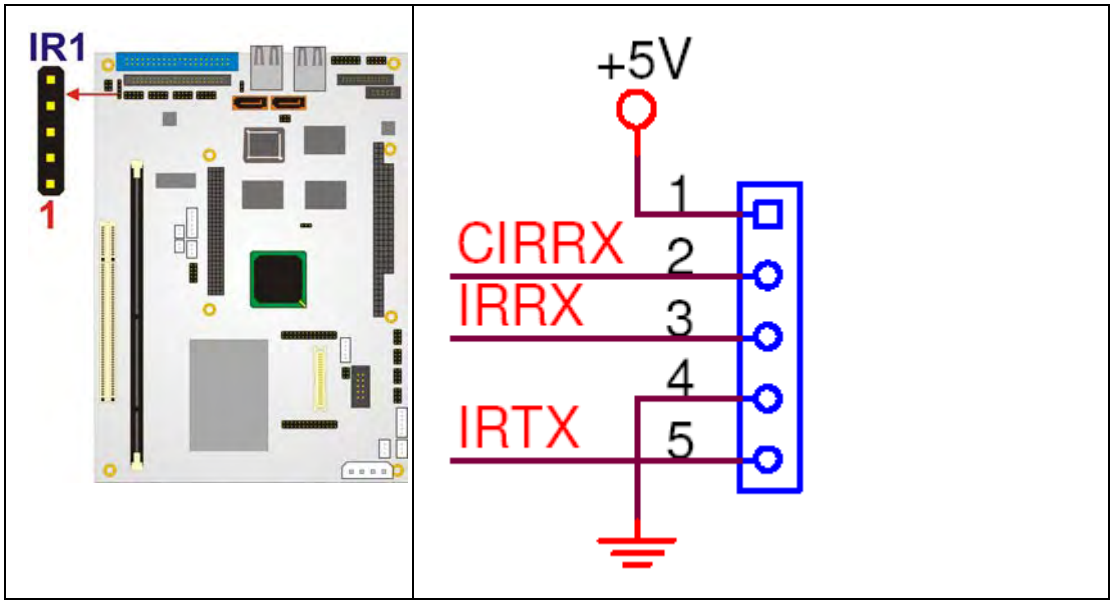


Figure 3-14: IR Connector Pinout Locations

PIN NO.	DESCRIPTION
1	5V
2	CIRRX
3	IRRX
4	GND

5	IRTX

Table 3-15: IR Connector Pinouts

3.2.13 LVDS Connector

CN Label: **J3** (on 3907720 daughterboard)

CN Type: 30-pin header (2x15)

CN Location: See **Figure 3-15**

CN Pinouts: See **Table 3-16**

WARNING:

Make sure the daughterboard is correctly positioned on the 3308050 motherboard connector pins. If the 3907720 is not correctly positioned irreparable damage to the motherboard, daughterboard and display may occur. Please refer to the installation instructions in ***Chapter 4***.

The LVDS LCD connector (J3) on the 3907720 daughterboard connects to a one or two channel (18-bit or 24-bit) LVDS panel.

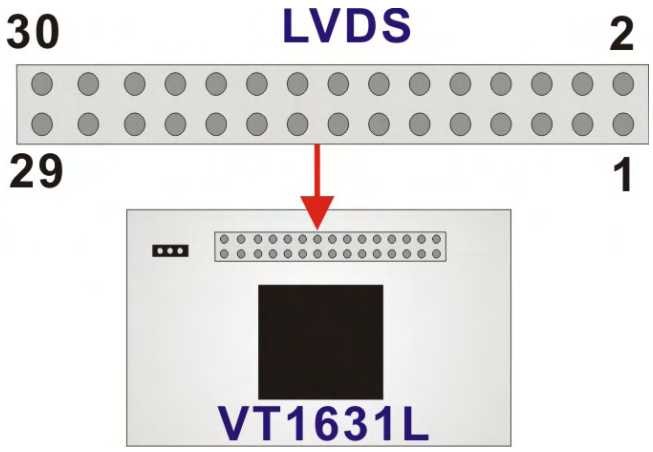


Figure 3-15: LVDS Connector Pinout Locations (on 3907720)

PIN	DESCRIPTION	PIN	DESCRIPTION
1	GND	2	GND
3	1st LVDS data0 output +	4	1st LVDS data0 output -
5	1st LVDS data1 output +	6	1st LVDS data1 output -
7	1st LVDS data2 output +	8	1st LVDS data2 output -
9	1st LVDS clock output +	10	1st LVDS clock output -
11	1st LVDS data3 output +	12	1st LVDS data3 output -
13	GND	14	GND
15	2nd LVDS data0 output +	16	2nd LVDS data0 output -
17	2nd LVDS data1 output +	18	2nd LVDS data1 output -
19	2nd LVDS data2 output +	20	2nd LVDS data2 output -
21	2nd LVDS clock output +	22	2nd LVDS clock output -
23	2nd LVDS data3 output +	24	2nd LVDS data3 output -
25	GND	26	GND
27	+LCD (3.3V,5V or 12V)	28	+LCD (3.3V,5V or 12V)
29	+LCD (3.3V,5V or 12V)	30	+LCD (3.3V,5V or 12V)

Table 3-16: LVDS Connector Pinouts

3.2.14 Keyboard/Mouse Connector

CN Label: **KB/PS1**

CN Type: 6-pin header (1x6)

CN Location: See **Figure 3-16**

CN Pinouts: See **Table 3-17**

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.

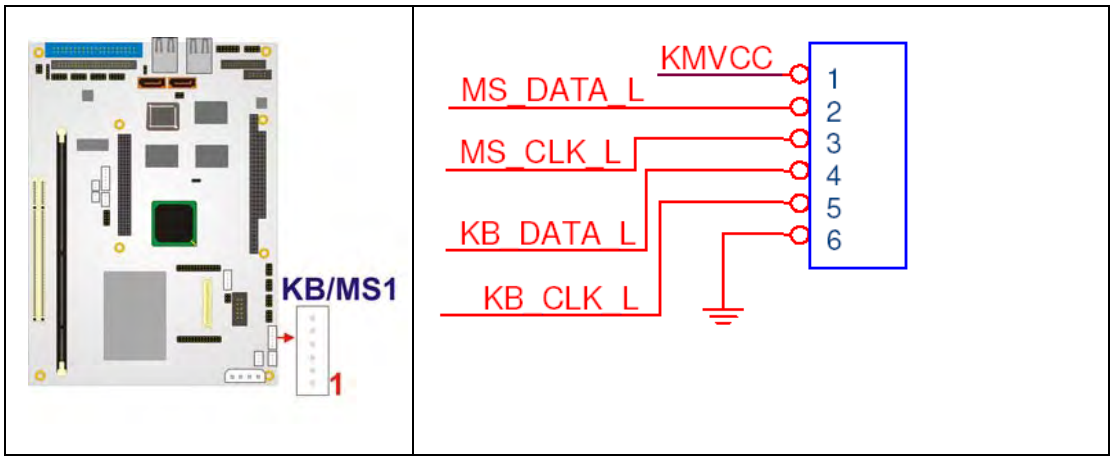


Figure 3-16: Keyboard/Mouse Connector Location

PIN NO.	DESCRIPTION
1	KMVCC
2	MS_DATA_L
3	MS_CLK_L
4	KB_DATA_L
5	KB_CLK_L
6	GROUND

Table 3-17: Keyboard/Mouse Connector Pinouts

3.2.15 LCD LVDS Converter Module Connector 1

CN Label: **J4**

CN Type: 28-pin header (2x14)

CN Location: See **Figure 3-17**

CN Pinouts: See **Figure 3-17**

The LVDS LCD converter module is the first of two connectors that the optional LVDS 3907720 daughterboard is mounted on.

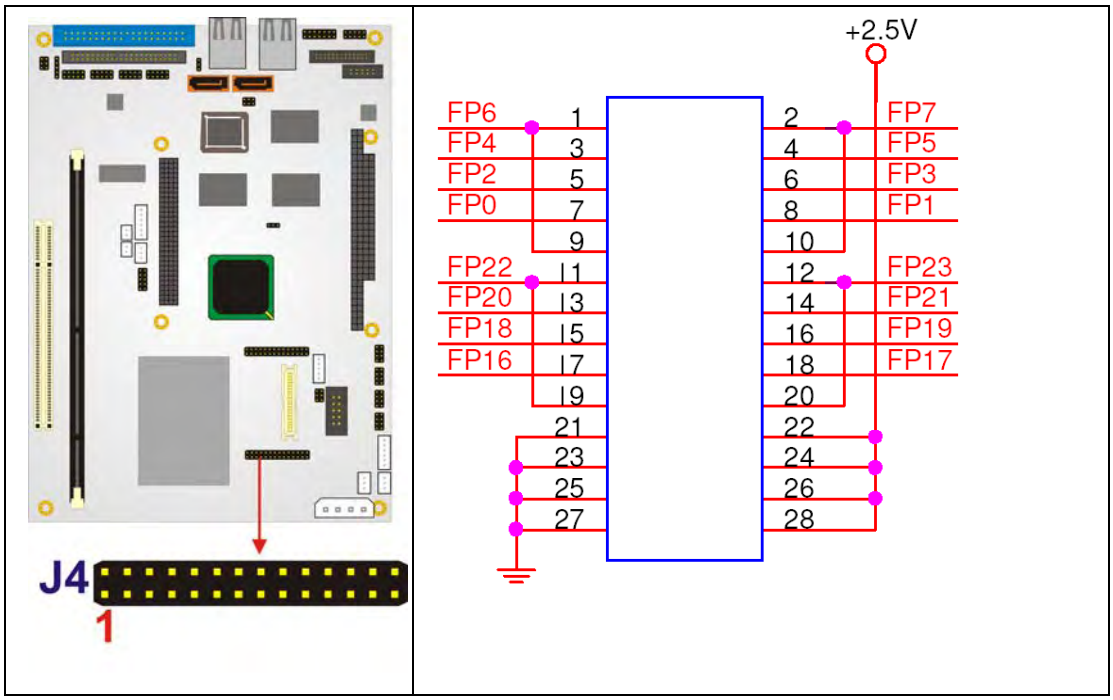


Figure 3-17: LVDS Converter Module Connector 1 Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	FP6	2	FP7
3	FP4	4	FP5
5	FP2	6	FP3
7	FP0	8	FP1
9	FP6	10	FP7
11	FP22	12	FP23
13	FP20	14	FP21
15	FP18	16	FP19
17	FP16	18	FP17
19	FP22	20	FP23
21	GND	22	+2.5V
23	GND	24	+2.5V
25	GND	26	+2.5V
27	GND	28	+2.5V

Table 3-18: LVDS Converter Module Connector 1 Pinouts

3.2.16 LCD LVDS Converter Module Connector 2

CN Label: **J5**

CN Type: 28-pin header (2x14)

CN Location: See **Figure 3-18**

CN Pinouts: See **Table 3-19**

The LVDS LCD converter module is the second of two connectors that the optional LVDS 3907720 daughterboard is mounted on.

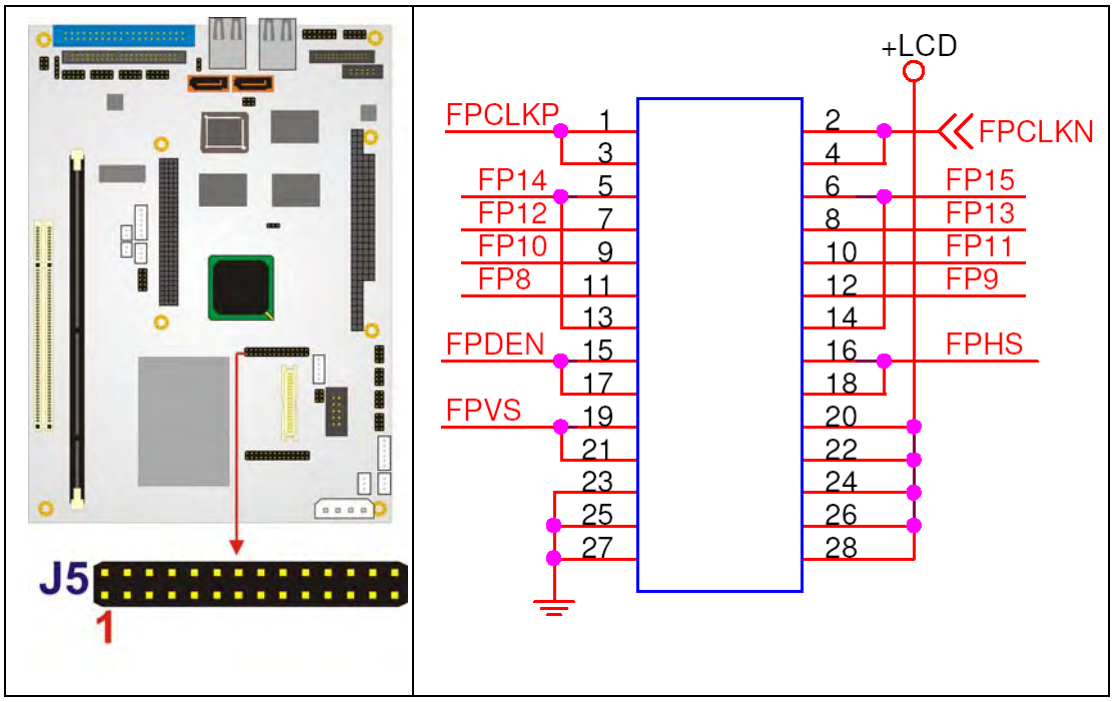


Figure 3-18: LVDS Converter Module Connector 2 Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	FPCLKP	2	FPCLKN
3	FPCLKP	4	FPCLKN
5	FP14	6	FP15
7	FP12	8	FP13
9	FP10	10	FP11
11	FP8	12	FP9

13	FP14	14	FP15
15	FPDEN	16	FPHS
17	FPDEN	18	FPHS
19	FPVS	20	+LCD
21	FPVS	22	+LCD
23	GND	24	+LCD
25	GND	26	+LCD
27	GND	28	+LCD

Table 3-19: LVDS Converter Module Connector 2 Pinouts

3.2.17 Parallel Port Connector

CN Label: **LPT1**

CN Type: 25-pin female connector

CN Location: See **Figure 3-19**

CN Pinouts: See **Table 3-20**

The 3308050 has one rear parallel port connector that can be connected to a parallel port connector interface or some other parallel port device such as a printer.

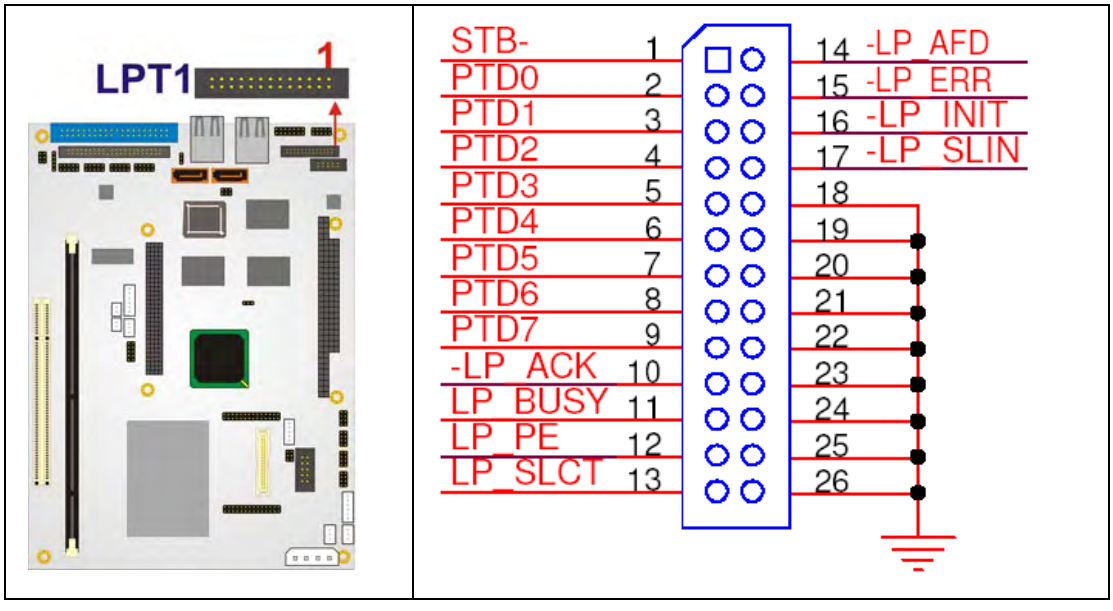


Figure 3-19: Parallel Port Connector Location

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
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	N/C
25	GROUND	26	

Table 3-20: Parallel Port Connector Pinouts

3.2.18 PC/104 Slot

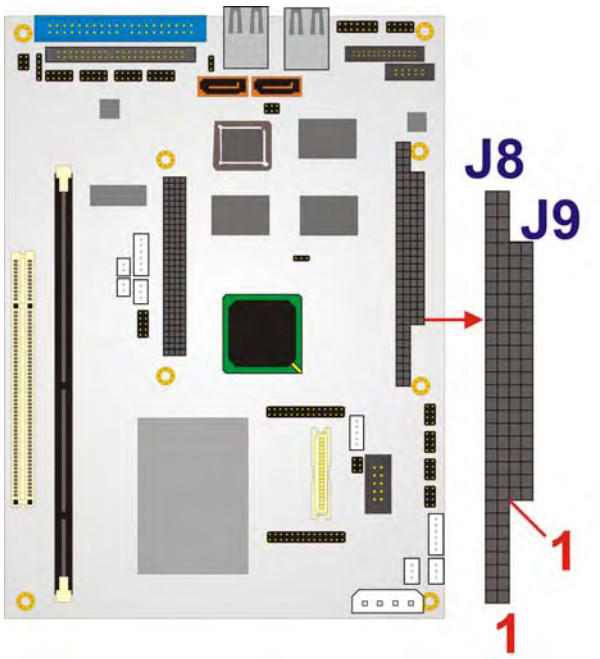
CN Label: **J8, J9**

CN Type: 104-pin PC/104 slot

CN Location: See **Figure 3-20**

CN Pinouts: See **Table 3-21**

The PC/104 slot enables a PC/104 compatible expansion module to be connected to the board.


J8
J9
1
1

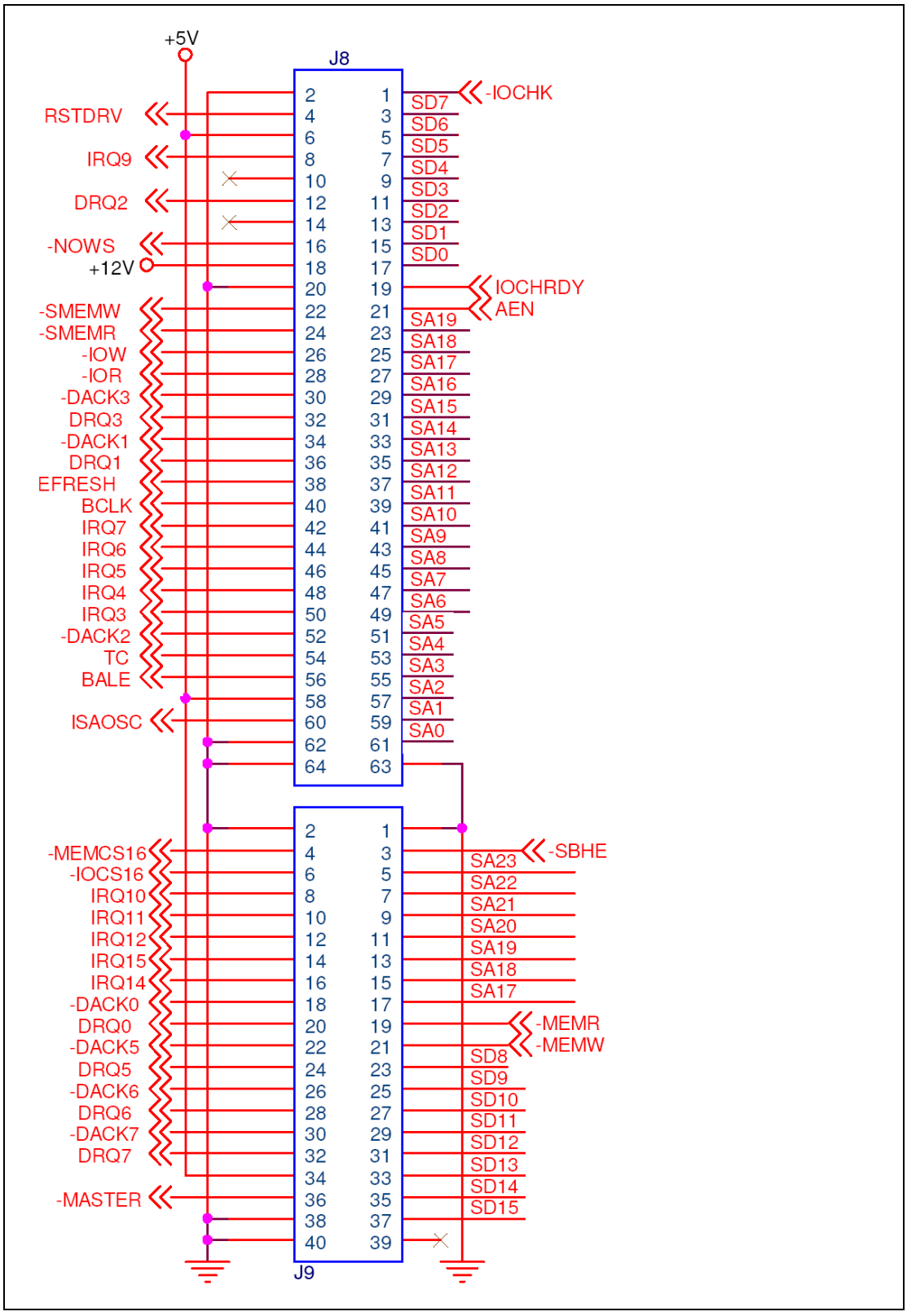


Figure 3-20: PC/104 Slot Location

Pin No.	Column A	Column B	Column C	Column D
1	IOCHK-	GROUND	GROUND	GROUND
2	SD7	RSTDRV	SBHE-	MCS16-
3	SD6	+5V	SA23	IOCS16-
4	SD5	IRQ9	SA22	IRQ10
5	SD4	-5V	SA21	IRQ11
6	SD3	DREQ2	SA20	IRQ12
7	SD2	-12V	SA19	IRQ15
8	SD1	ZWS-	SA18	IRQ14
9	SD0	+12V	SA17	DACK0-
10	IOCHRDY	GROUND	MEMR-	DREQ0
11	AEN	SMEMW-	MEMW-	DACK5-
12	SA19	SMEMR-	SD8	DRREQ5
13	SA18	IOW-	SD9	DACK6-
14	SA17	IOR-	SD10	DREQ6
15	SA16	DACK3-	SD11	DACK7-
16	SA15	DREQ3	SD12	DREQ7
17	SA14	DACK1-	SD13	+5V
18	SA13	DREQ1	SD14	MASTER-
19	SA12	REFRESH-	SD15	GROUND
20	SA11	ISACLK	NC	GROUND
21	SA10	IRQ7		
22	SA9	IRQ6		
23	SA8	IRQ5		
24	SA7	IRQ4		
25	SA6	IRQ3		
26	SA5	DACK2-		
27	SA4	TC		
28	SA3	BALE		
29	SA2	+5V		
30	SA1	ISA_OSC		

31	SA0	GROUND		
32	GROUND	GROUND		

Table 3-21: PC/104 Slot Connector Pinouts

3.2.19 PCI-104 Slot

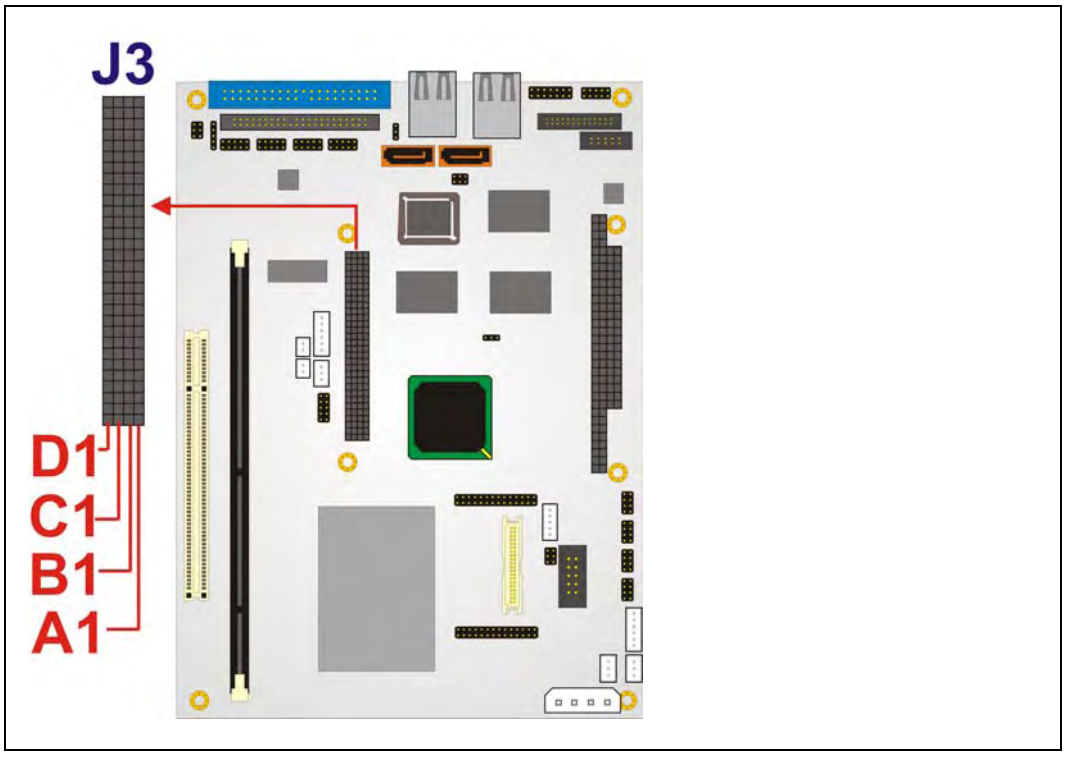
CN Label: **J3**

CN Type: 120-pin PCI-104 slot

CN Location: See **Figure 3-21**

CN Pinouts: See **Table 3-22**

The PCI-104 slot enables a PCI-104 compatible expansion module to be connected to the board.



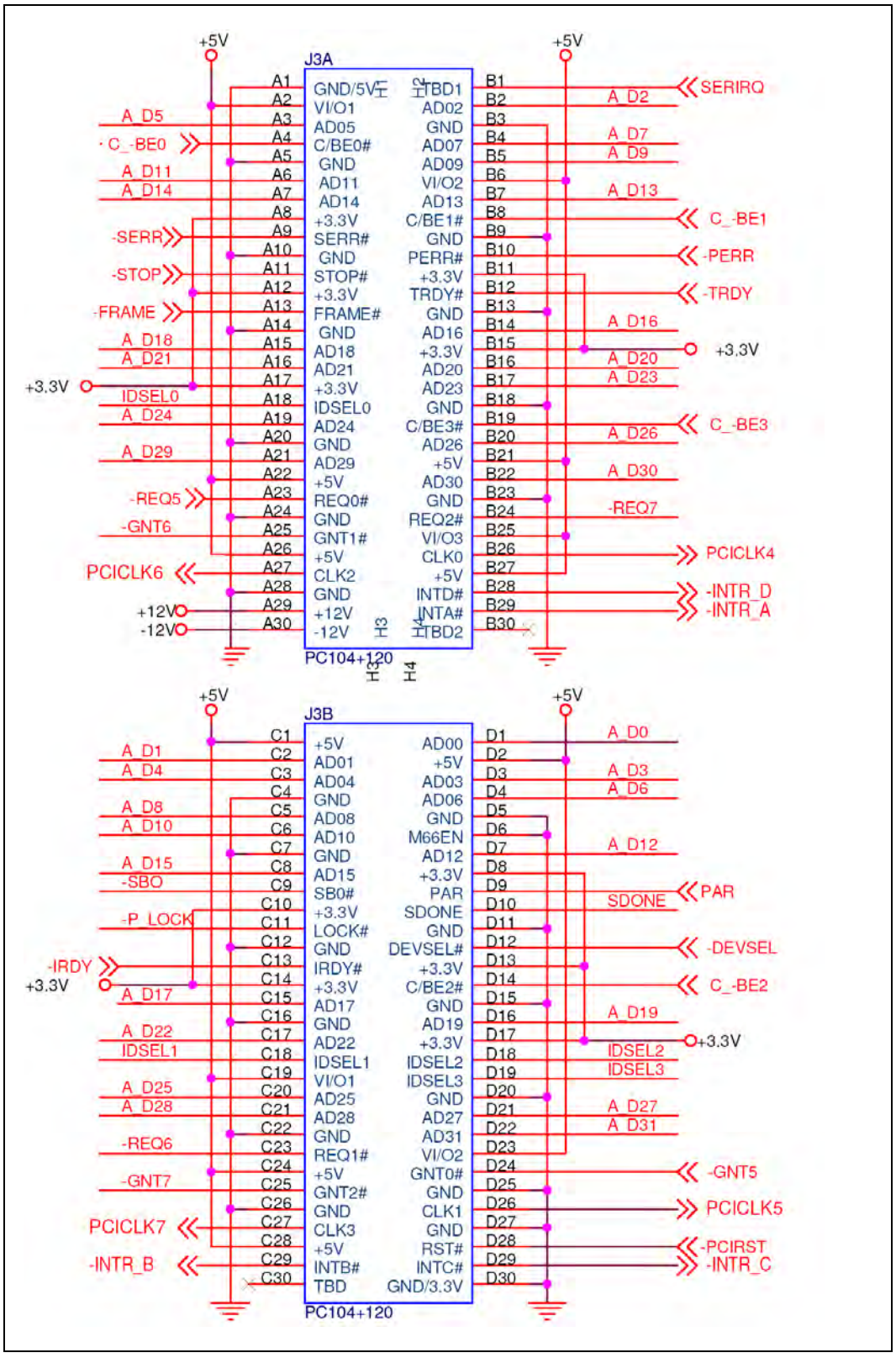


Figure 3-21: PCI-104 Slot Location

Pin No.	Column A	Column B	Column C	Column D
1	GND/5V	TBD1	5V	AD00
2	VI/O1	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O2	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	SB0#	PAR
10	GND	PERR#	+3.3V	SDONE
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O1	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O2
24	GND	REQ2#	+5V	GNT0#
25	GNT1#	VI/O3	GNT2#	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	TBD2	TBD	GND/3.3V

Table 3-22: PCI-104 Slot Connector Pinouts

3.2.20 PCI Slot

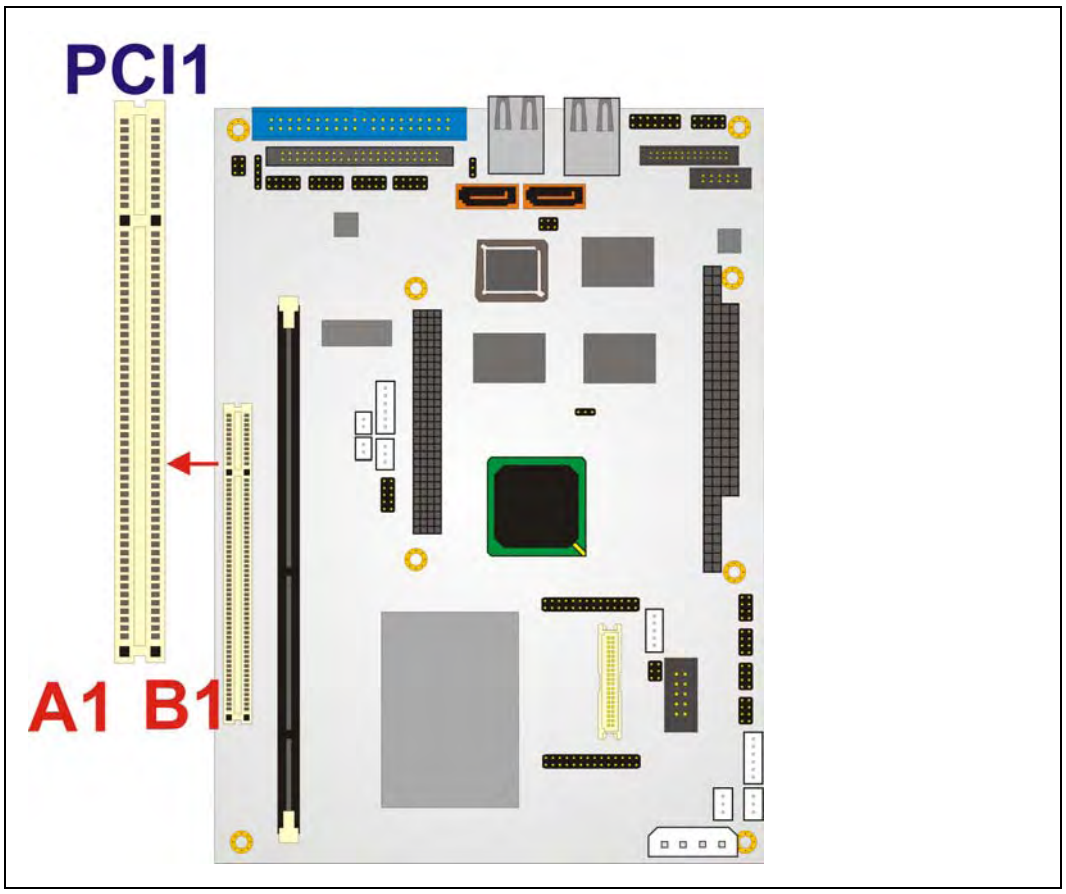
CN Label: **PCI1**

CN Type: PCI slot

CN Location: See **Figure 3-22**

CN Pinouts: See **Table 3-23**

The PCI slot enables a PCI expansion module to be connected to the board.



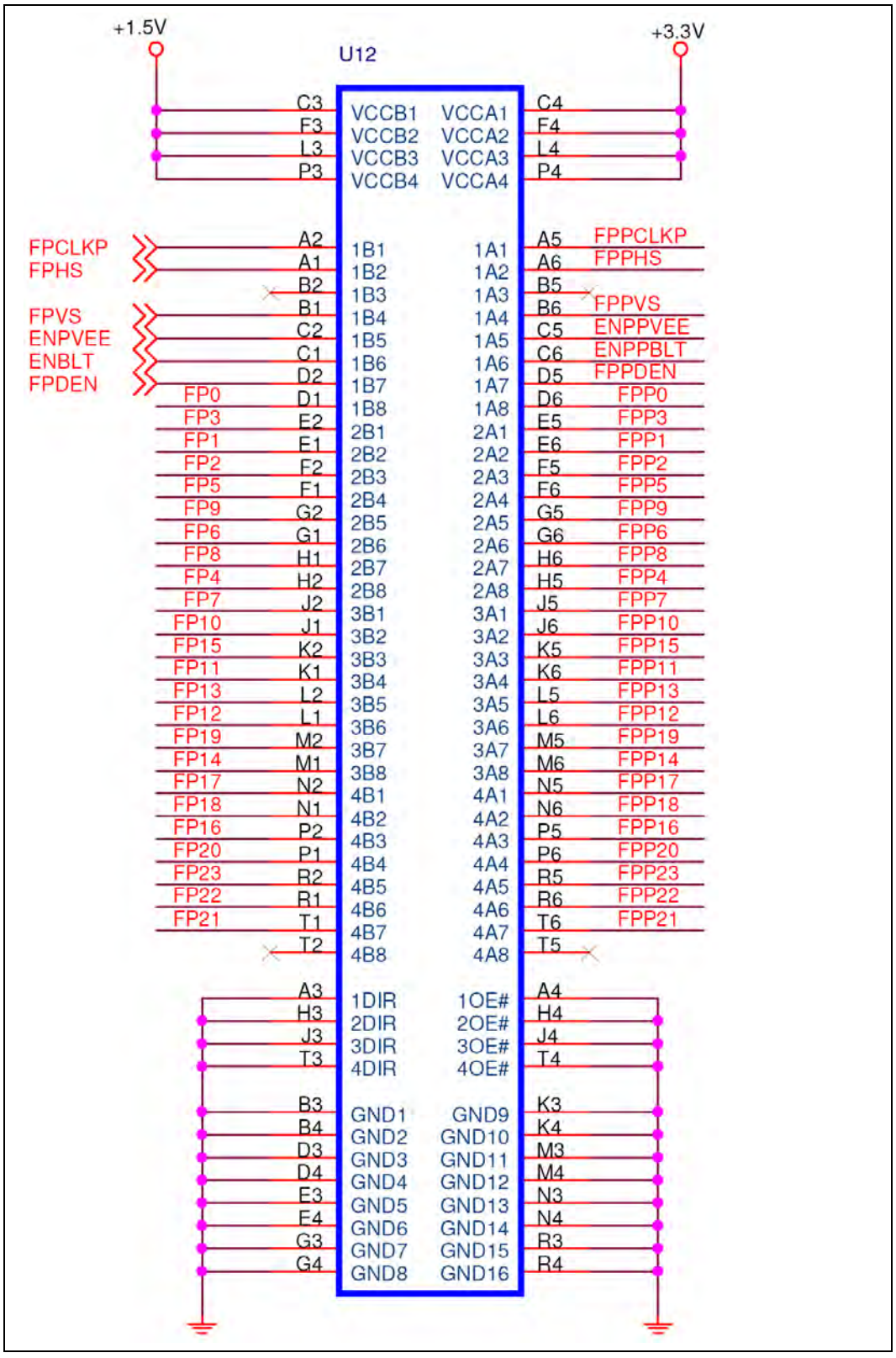


Figure 3-22: PCI Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12V
A2	+12V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5V	B5	+5V
A6	INTA	B6	+5V
A7	INTC	B7	INTB
A8	+5V	B8	INTD
A9	RESERVED3	B9	PRSNT1
A10	+5V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND
A14	3.3V_AUX	B14	RESERVED2
A15	RST	B15	GND
A16	+5V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5V
A20	AD30	B20	AD31
A21	+3.3V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3V
A26	IDSEL	B26	C/BE3
A27	+3.3V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3V
A32	AD16	B32	AD17

A33	+3.3V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3V
A42	GND	B42	SERR
A43	PAR	B43	+3.3V
A44	AD15	B44	C/BE1
A45	+3.3V	B45	AD14
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3V	B53	AD7
A54	AD6	B54	+3.3V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5V	B59	+5V
A60	REQ64	B60	ACK64
A61	+5V	B61	+5V
A62	+5V	B62	+5V

Table 3-23: PCI Slot

3.2.21 Power Switch Connector

CN Label: **CN2**

CN Type: 2-pin header (1x2)

CN Location: See **Figure 3-23**

CN Pinouts: See **Table 3-24**

The power switch connector is connected to the power switch on the external chassis.

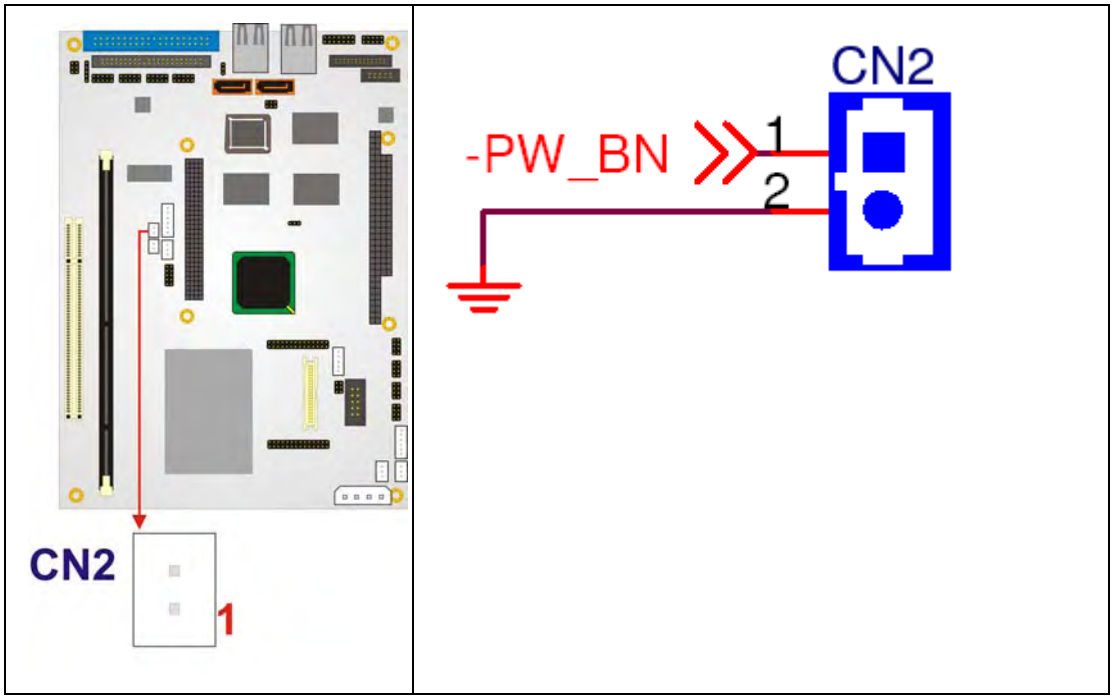


Figure 3-23: Power Switch Connector Locations

PIN NO.	DESCRIPTION
1	Power Switch
2	GND

Table 3-24: Power Switch Connector Pinouts

3.2.22 Reset Button Connector

CN Label: **CN1**

CN Type: 2-pin header (1x2)

CN Location: See **Figure 3-24**

CN Pinouts: See **Table 3-25**

The reset button connector is connected to the reset button on the external chassis.

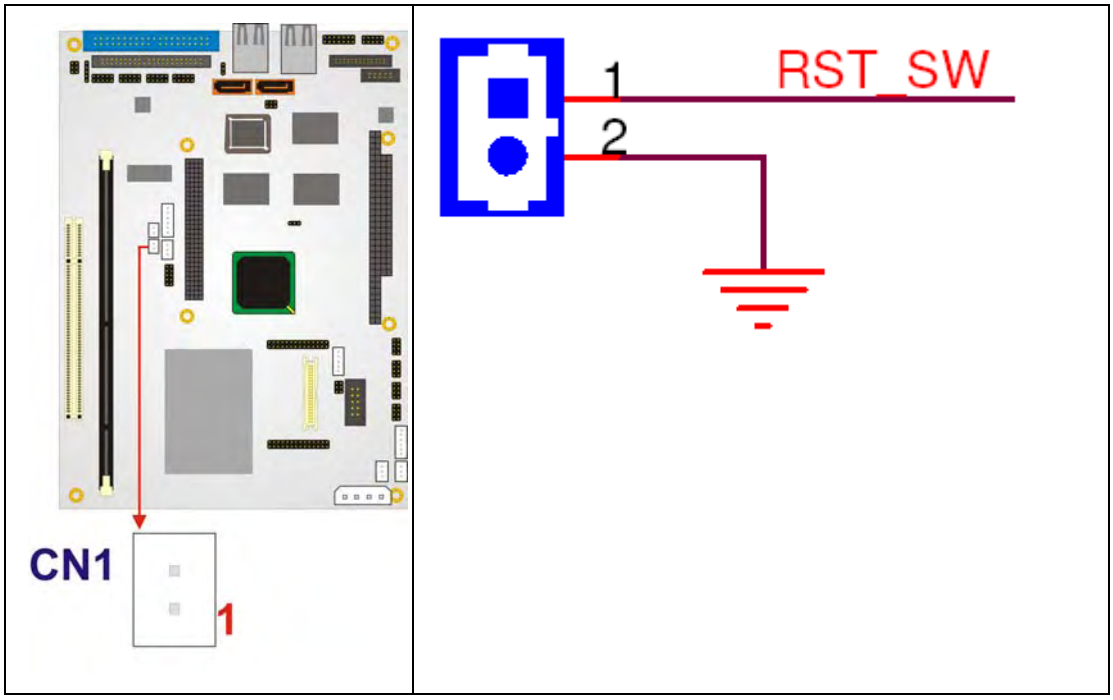


Figure 3-24: Reset Button Connector Locations

PIN NO.	DESCRIPTION
1	Reset Switch
2	GND

Table 3-25: Reset Button Connector Pinouts

3.2.23 RS-232 Serial Port Connectors

CN Label: **COM1**, **COM2**, **COM3, COM4, COM5** and **COM6**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-25**

CN Pinouts: See **Table 3-26**

The COM1, COM3, COM4 COM5 and COM6 serial ports connectors connect to RS-232 serial port devices.

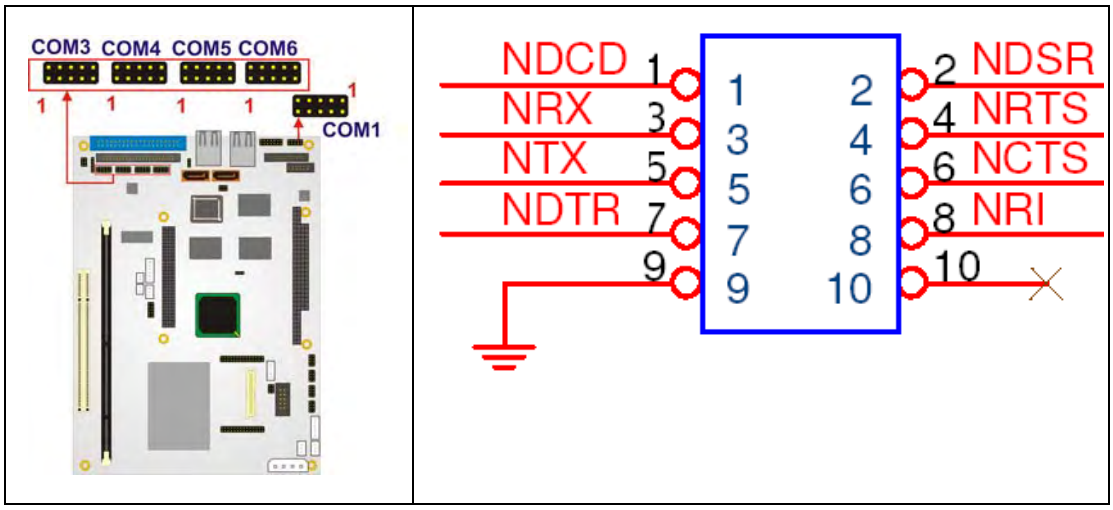


Figure 3-25: RS-232 Serial Port Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD	2	NDSR
3	NRX	4	NRTS
5	NTX	6	NCTS
7	NDTR	8	NRI
9	GND	10	GND

Table 3-26: RS-232 Serial Port Connector Pinouts

3.2.24 RS-232/422/485 Serial Port Connector

CN Label: **COM2**

CN Type: 14-pin header (2x7)

CN Location: See **Figure 3-26**

CN Pinouts: See **Table 3-27**

The COM2 serial port connector connects to an RS-232, RS-422 or RS-485 serial port devices.

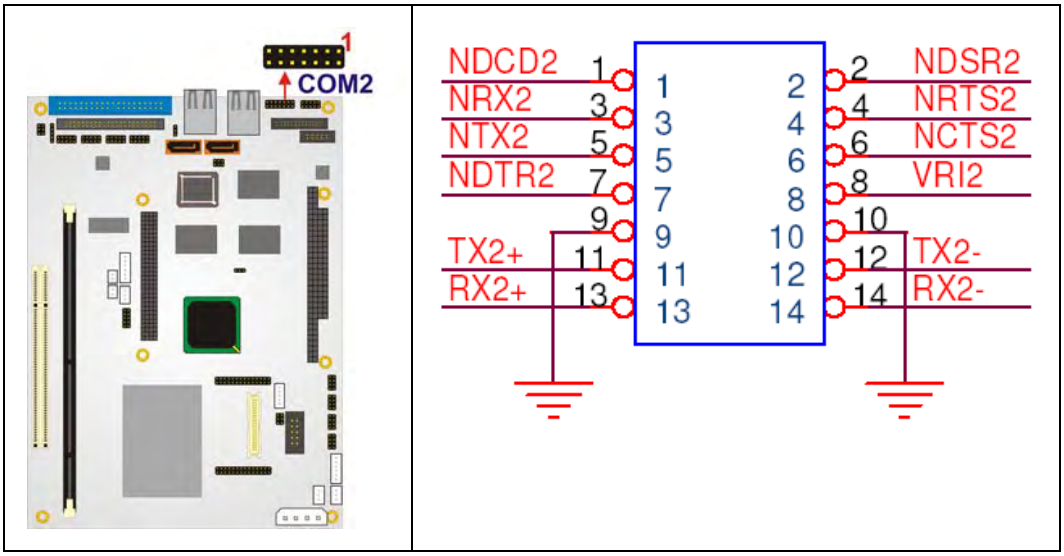


Figure 3-26: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD2	2	NDSR2
3	NRX2	4	NRTS2
5	NTX2	6	NCTS2
7	NDTR2	8	NRI2
9	GND	10	GND
11	TX2+ (RS-422/485)	12	TX2- (RS-422/485)
13	RX2+ (RS-422)	14	RX2- (RS-422)

Table 3-27: RS-232/RS-422/RS-485 Serial Port Connector Pinouts

3.2.25 SATA Drive Connectors

CN Label: **SATA1** and **SATA2**

CN Type: 7-pin SATA drive connectors

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-30**

The two SATA drive connectors are connected to two first generation SATA drives. First generation SATA drives transfer data at speeds as high as 150MB/s.

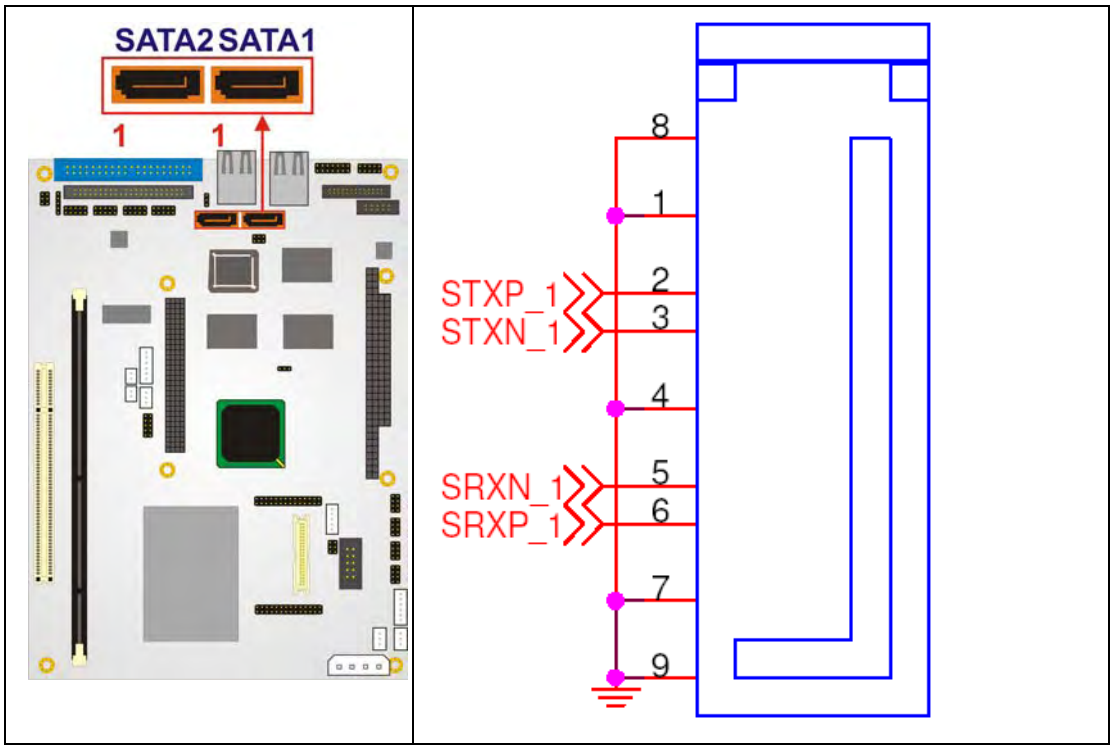


Figure 3-27: SATA Drive Connector Locations

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

6	RX+
7	GND

Table 3-28: SATA Drive Connector Pinouts

3.2.26 TTL Connector

CN Label: **J7**

CN Type: 40-pin TTL connector

CN Location: See **Figure 3-28**

CN Pinouts: See **Table 3-29**

The TTL connector is connected to a TTL display device. For 18-bit TTL, connect RGB signal 2-7 (pin 11-16, pin 19-24 and pin 27-32). For 24-bit TTL, connect RGB signal 0-7 (pin 9-32).

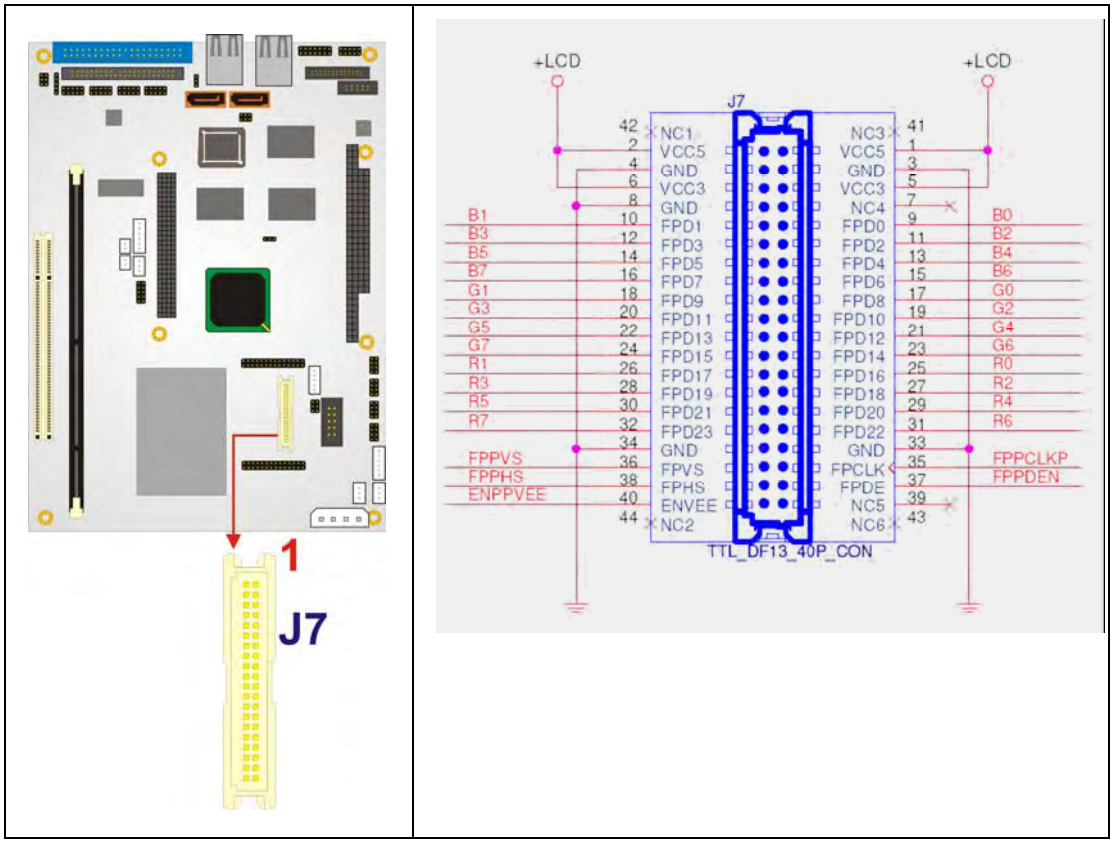


Figure 3-28: TTL Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+LCD	2	+LCD
3	GND	4	GND
5	+LCD	6	+LCD
7	NC	8	GND
9	B0	10	B1
11	B2	12	B3
13	B4	14	B5
15	B6	16	B7
17	G0	18	G1
19	G2	20	G3
21	G4	22	G5
23	G6	24	G7
25	R0	26	R1
27	R2	28	R3
29	R4	30	R5
31	R6	32	R7
33	GND	34	GND
35	FPPCLKP	36	FPPVS
37	FPPDEN	38	FPPHS
39	NC	40	ENPPVEE

Table 3-29: TTL Connector Pinouts

3.2.27 Internal USB Connectors

CN Label: **JUSB1**, **JUSB2, JUSB3** and **JUSB4**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 3-29**

CN Pinouts: See **Table 3-30**

The 2x4 USB pin connectors provide connectivity USB 2.0 ports. Each USB connector can support two USB devices. The USB ports are used for I/O bus expansion.

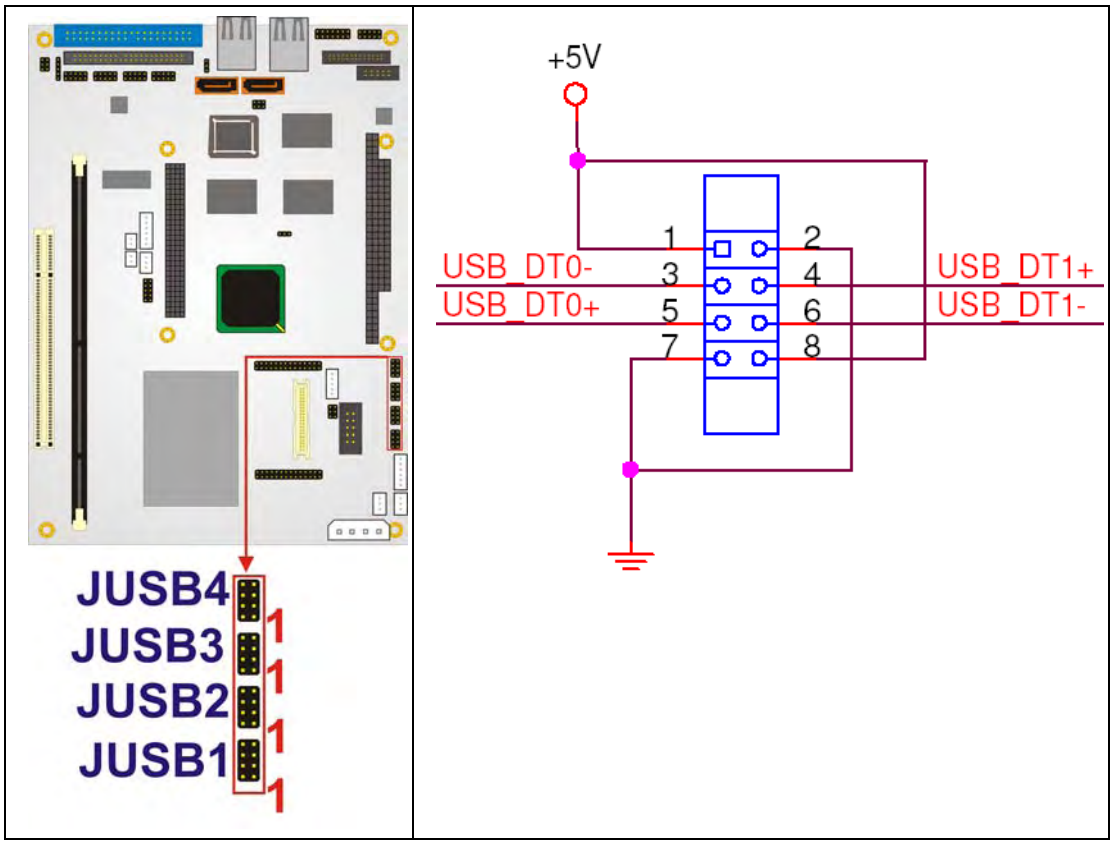


Figure 3-29: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATAN-	4	DATA1M+
5	DATAN+	6	DATAM-
7	GND	8	VCC

Table 3-30: USB Port Connector Pinouts

3.2.28 VGA Connector (Internal)

CN Label: **VGA1**

CN Type: 10-pin header (2x5)

CN Location: See **Figure 3-30**

CN Pinouts: See **Table 3-31**

The internal VGA connector connects to an external VGA display for system monitoring.

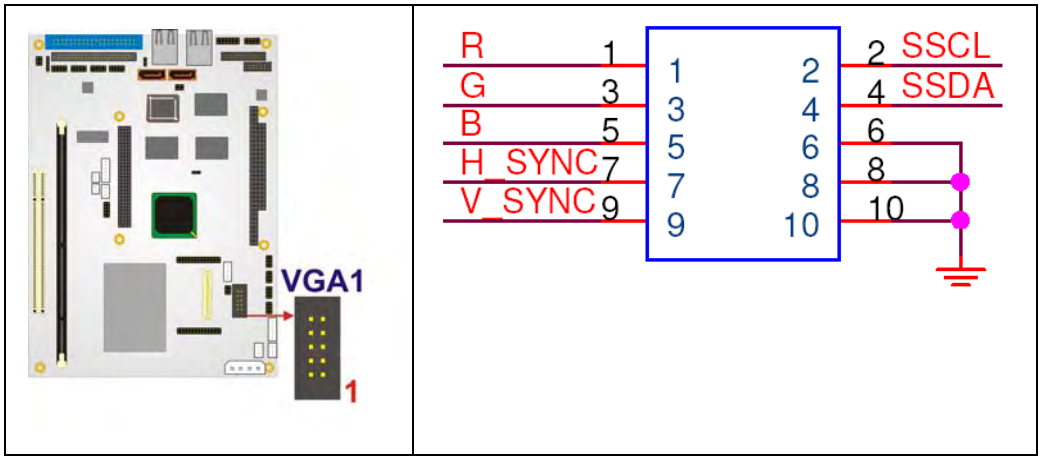


Figure 3-30: VGA Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RED	2	DDC CLK
3	GREEN	4	DDC DAT
5	BLUE	6	GND
7	HSYNC	8	GND
9	VSYNC	10	GND

Table 3-31: VGA Connector Pinouts

3.3 External Interface Connectors

Figure 3-31 shows the 3308050 external interface connector panel. The 3308050 rear panel consists of two RJ-45 Ethernet connectors. These connectors are accessible when the 3308050 is installed in a chassis.

- 2 x RJ-45 GbE connector

Figure 3-31: 3308050 Rear Panel

3.3.1 LAN Connectors

CN Label: **LAN1** and **LAN2** (See **Figure 3-31**)

CN Type: RJ-45

CN Location: See **Figure 3-31**

CN Pinouts: See **Table 3-32** (RJ-45)

The 3308050 is equipped with two built-in GbE 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	+2.5VCC	2	TX0+
3	TX0-	4	TX1+
5	TX1-	6	TX2+
7	TX2-	8	TX3+
9	TX3-	10	GND
11	LINK-	12	LINK+
13	ACTIVE-	14	ACTIVE+

Table 3-32: LAN Pinouts

Figure 3-32: RJ-45 Ethernet 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 3-33**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 3-33: RJ-45 Ethernet Connector LEDs

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Chapter

4

Installation and Configuration

4.1 Anti-static Precautions

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3308050. (Dry climates are especially susceptible to ESD.) It is therefore critical that whenever the 3308050 (or any other electrical component) is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wrist band***: - Wearing a simple anti-static wrist band 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.

4.2 Installation Considerations

NOTE:

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

4.2.1 Installation Notices

Before and during the installation of the 3308050 motherboard, please **do** the following:

- Read the user manual
  - The user manual provides a complete description of the 3308050 motherboard, 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 user's body and help to prevent ESD damage.

- Place the Motherboard on an antistatic pad
  - When the Motherboard is installed and configured, place it on an antistatic pad. This helps to prevent potential ESD damage.

- Turn off all power to the 3308050 motherboard
  - When working with the Motherboard, 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 3308050 motherboard **DO NOT:**

- remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- use the product before all the cables and power connectors are properly connected.
- allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.3 Unpacking

NOTE:

If any of the items listed below are missing when the 3308050 is unpacked, do not proceed with the installation and contact the reseller or vendor Motherboard was purchased from.

4.3.1 Unpacking Precautions

Some components on 3308050 are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from being damaged during the unpacking process, follow these precautions:

- The user should ground themself to remove any static charge before touching the 3308050. To ground themselves users can wear a grounded wrist

strap at all times or frequently touching any conducting materials that is connected to the ground.

- Handle the 3308050 by its edges. Do not touch the IC chips, leads or circuitry unneccessarily.

Do not place a PCB on top of an anti-static bag. Only the inside of the bag is safe from static discharge.

4.3.2 Checklist

When 3308050 is unpacked please make sure the package contains the following items.

- 1x 3308050 single board computer
- 1 x ATA 66/100 flat cable
- 2 x SATA cables
- 1 x SATA power cable
- 3 x Single RS-232 cables
- 1 x RS-232/422/485 cable
- 1 x KB/MS cable
- 1 x VGA cable
- 1 x USB cable
- 1 x Audio cable
- 1 x Mini jumper pack
- 1x Utility CD
- 1x Quick Installation Guide

If one or more of these items are missing, please contact the reseller or vendor 3308050 was purchased from and do not proceed any further with the installation.

4.4 3308050 Motherboard Installation

WARNING!

Never run the 3308050 without an appropriate heatsink and cooler that can be ordered from GAI Technology or purchased separately.

WARNING!

Please note that the installation instructions described in this manual should be carefully followed in order to avoid damage to the 3308050 components and injury to the user.

WARNING!

When installing electronic components onto the 3308050 always take the following anti-static precautions in order to prevent ESD damage to the 3308050 and other electronic components like the CPU and DIMM modules

4.4.1 Preinstalled Components

The components listed below are preinstalled on the 3308050.

- CPU
- CPU heat sink

4.4.2 Components to Install

To install the 3308050, the following components must be installed or connected to the 3308050

- DIMM modules
- Optional 3907720 daughterboard
- Peripheral devices

4.4.3 DIMM Module Installation

4.4.3.1 Purchasing the Memory Module

When purchasing DIMM modules, the following considerations should be taken into account: to 1GB of 333MHz or 400MHz of DDR memory

- The DIMM module can support a memory chip with a maximum size of 1GB
- The DIMM module can have a of 333MHz or 400MHz
- The DIMM can be either single-sided or dual-sided.

4.4.3.2 DIMM Module Installation

The 3308050 motherboard has one DDR SDRAM DIMM sockets. To install the DIMM modules, follow the instructions below and refer to ***Figure 4-1***.

Step 1: Pull the two white handles on either side of the DIMM socket down.

Step 2: Align the DIMM module with the DIMM socket making sure the matching pins are correctly aligned.

Step 3: Insert the DIMM module slowly. Once it is correctly inserted, push down firmly. The white handles on either side of the socket move back up and lock the module into the socket.

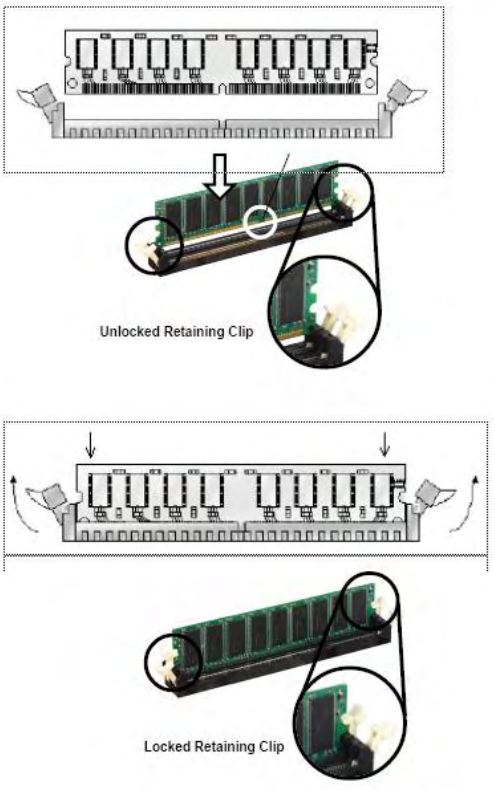


Figure 4-1: DIMM Module Installation

4.4.4 Optional 3907720 Daughterboard Installation

WARNING:

Installing the 3907720 daughterboard incorrectly may cause irreparable damage to the LVDS display and the 3308050

The 3907720 daughterboard supports 18-bit and 24-bit LVDS devices. The 3907720 daughterboard is installed on the J4 and J5 connectors. If 18-bit LVDS connectivity is required, Pin 27 and Pin 28 on J4 and J5 must be left uncovered. If 24-bit LVDS connectivity is required, Pin 1 and Pin 2 on J4 and J5 must be left uncovered. For further details see below.

4.4.4.1 18-bit LVDS Connectivity

To correctly install the 3907720 daughterboard to support an 18-bit LVDS display, please follow the instructions below.

Step 1: Correctly orientate the 3907720 daughterboard. The VIA chipset on the 3907720 daughterboard should on the side of the 3907720 facting the gold finger backplane connectors. The VIA chipset on the 3907720 should be on the side closest to the CPU.

Step 2: Align the connectors on the bottom of the 3907720 with pins 1 – pins 26 on the J1 and J3 connectors.

Step 3: Slide the 3907720 onto the connectors. Pin 27 and pin 28 on both the J1 and J3 connector should be visible. See **Figure 4-2**.

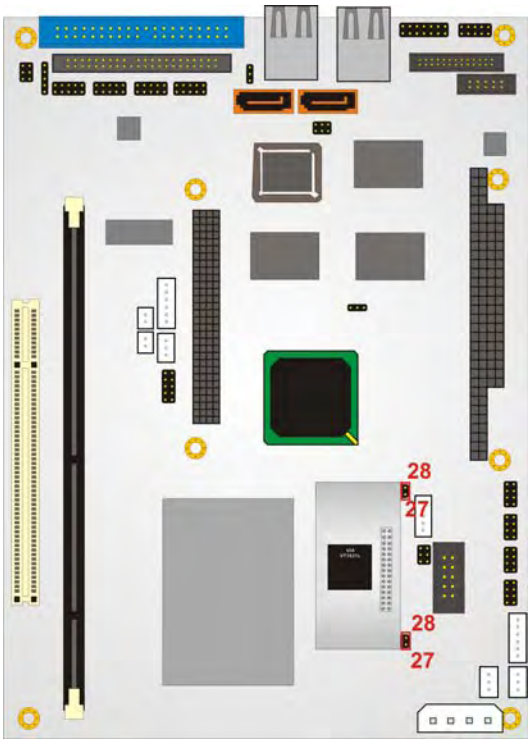


Figure 4-2: 18-bit LVDS 3907720 Connectivity

4.4.4.2 24-bit LVDS Connectivity

To correctly install the 3907720 daughterboard to support a 24-bit LVDS display, please follow the instructions below.

Step 4: Correctly orientate the 3907720 daughterboard. The VIA chipset on the 3907720 daughterboard should on the side of the 3907720 facting the gold finger backplane connectors. The VIA chipset on the 3907720 should be on the side closest to the CPU.

Step 5: Align the connectors on the bottom of the 3907720 with Pin 3 – Pin 28 on the J4 and J5 connectors.

Step 6: Slide the 3907720 onto the connectors. Pin 1 and Pin 2 on both the J4 and J5 connector should be visible. See **Figure 4-3**.

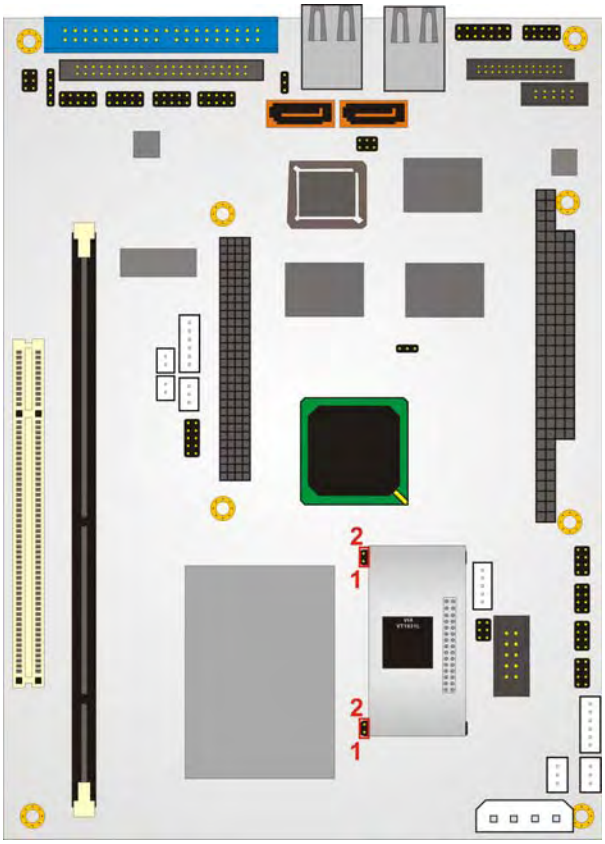


Figure 4-3: 24-bit LVDS 3907720 Connectivity

4.4.5 Peripheral Device Connection

Cables provided by GAI that connect peripheral devices to the board are listed in **Table 4-1**. Cables not included in the kit must be separately purchased.

Quantity	Type
1	mini jumper pack
1	ATA 66/100 HDD cable
2	SATA cables
1	SATA power cable
3	RS-232 cables
1	RS-232/422/485 cable
1	Keyboard/mouse cable
1	VGA cable
1	USB cable

1	Audio cable

Table 4-1: GAI Provided Cables

4.4.5.1 IDE Disk Drive Connector (IDE1)

The cable used to connect the 3308050 to the IDE HDD is a standard 44-pin ATA33 flat cable. To connect an IDE device to the 3308050 follow the instructions below.

Step 1: 0Find the ATA 66/100 flat cable in the kit that came with the motherboard.

Step 2: Connect one end of the cable to the IDE1 connector on the motherboard. A keyed pin on the IDE connectors prevents it from being connected incorrectly.

Step 3: Locate the red wire on the other side of the cable that corresponds to the pin 1 connector.

Step 4: Connect the other side of the cable to the HDD making sure that the pin 1 cable corresponds to pin 1 on the connector.

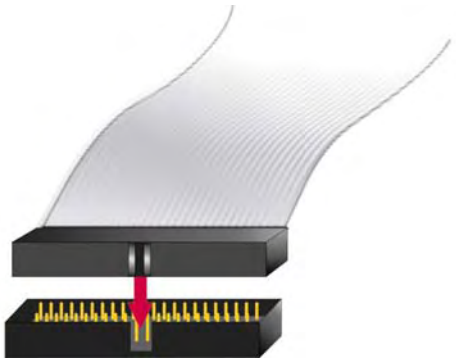


Figure 4-4: Connection of IDE Connector

NOTE:

When two EIDE disk drives are connected together, back-end jumpers on the drives must be used to configure one drive as a master and the other as a slave.

4.4.5.2 Compact Flash Connector

The compact flash connector is located on the bottom of the daughter expansion board. If a user wishes to implement the CF connector for CD drive connectivity, please follow these instructions.

Step 1: Connect one end of a ribbon cable to the IDE2 connector on the 3308050 motherboard.

Step 2: Connect the other end of the same ribbon cable in Step 1 to the IDE1 connector on the expansion daughterboard.

4.4.5.3 Parallel Port Connector (LPT1)

The onboard parallel port connector (LPT1) connects to a printer. The [Product Name] comes with a multi-mode (ECP/EPP/SPP) parallel port. The parallel port interface features a 26-pin flat-cable connector that requires an adapter cable if a traditional DB-25 connector is used. The parallel port interface can be re-assigned to LPT2 or LPT3 through the BIOS configuration utility. Select ECP or EPP DMA mode using the BIOS configuration utility.

4.4.5.4 Audio Interface

AC'97 Audio signals are interfaced through a 12-pin flat-cable connector. The signals include microphone line-in, line-in stereo, line-out stereo and speaker out stereo. An audio 12-pin-to-phone adapter kit is required.

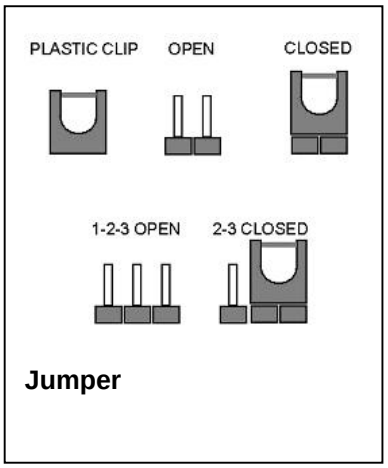
4.4.5.5 COM Port Connectors [COM1, COM2, COM3 and COM4]

The 3308050 provides six serial ports, The serial ports facilitate the connection to serial devices or a communications network, e.g., terminal console.

4.5 Jumper Settings

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit. It consists of two 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.



Jumper

Before the 3308050 is installed in the system, the jumpers must be set in accordance with the desired configuration. The 3308050 motherboard has six on-board jumpers.

Description	Label	Type
Clear CMOS Memory	J6	3-pin header
CF card configuration	JP3	3-pin header
LCD voltage setup	JP4	6-pin header
COM2 RS-232/485 Setup	JP1	3-pin header
COM2 RS-422/485 Setup	JP2	3-pin header
COM2 Voltage Select	JP5	3-pin header

Table 4-2: Jumpers

4.5.1 Clear CMOS Jumper

Jumper Label: **J6**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-3**

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

If the 3308050 fails to boot due to improper BIOS settings, use this connector to clear the CMOS data and reset 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.

Clear CMOS	DESCRIPTION
Short 1 - 2 (Default)	Keep CMOS Setup
Short 2 - 3	Clear CMOS Setup

Table 4-3: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 4-5** below.

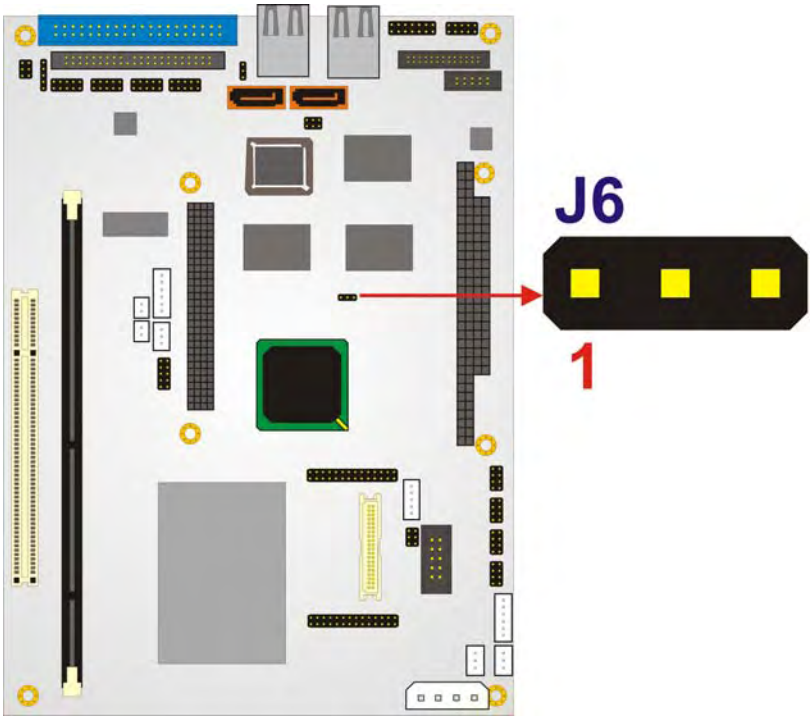


Figure 4-5: Clear CMOS Jumper

4.5.2 CF Card Setup

Jumper Label: **JP3**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-4**

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

The CF Card Setup jumper sets the compact flash card as either the slave device or the master device.

JP4	DESCRIPTION
Short 1-2 (Default)	Slave
Short 2-3	Master

Table 4-4: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in **Figure 4-6**

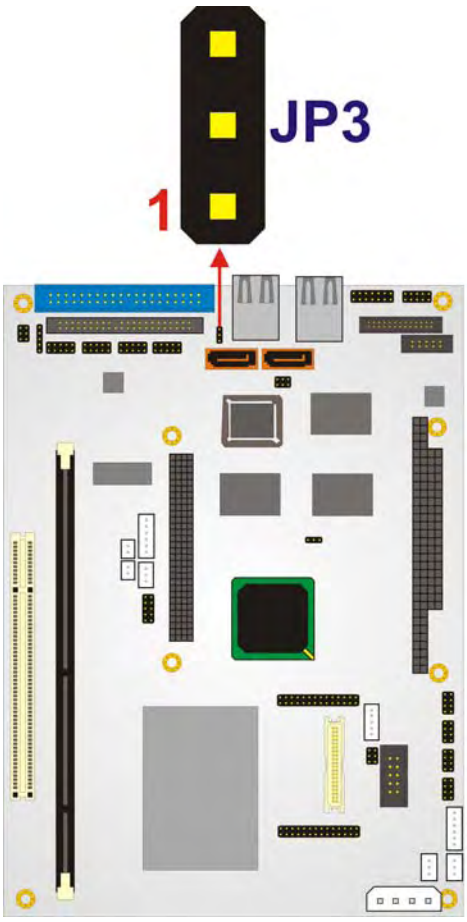


Figure 4-6: CF Card Setup Jumper Pinout Locations

4.5.3 LCD Voltage Setup Jumper

WARNING:

Making the wrong setting on this jumper may cause irreparable damage to both the motherboard and the LCD screen connected to the onboard connector.

Jumper Label: **JP4**

Jumper Type: 6-pin header

Jumper Settings: See **Table 4-5**

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

This jumper allows the user to set the voltage for the LCD panel. Before setting this jumper please refer to the LCD panel user guide to determine the required voltage. After the required voltage is known, make the necessary jumper setting in accordance with the settings shown in **Table 4-5**.

JP3	DESCRIPTION
Short 1-2 (Default)	+3V
Short 3-4	+5V
Short 5-6	+12V

Table 4-5: LCD Voltage Setup Jumper Settings

The LCD Voltage Setup jumper location is shown in **Figure 4-7** below.

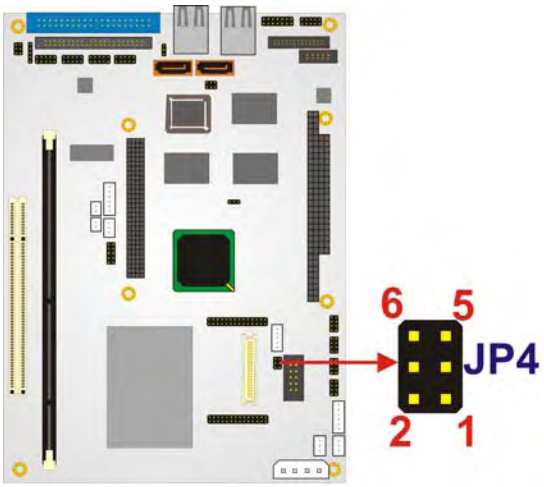


Figure 4-7: LCD Voltage Setup Jumper Pinout Locations

4.5.4 RS-232/485 Setup

Jumper Label: **JP1**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-6**

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

The RS-232/485 setup jumper sets the communication protocol used by the second serial communications port (COM2) as RS-232 or RS-485.

JP1	DESCRIPTION
Short 1-2	RS-232
Short 2-3	RS-485

Table 4-6: COM2 Setup Jumper Settings

The RS-232/485 Setup jumper location is shown in **Figure 4-8**.

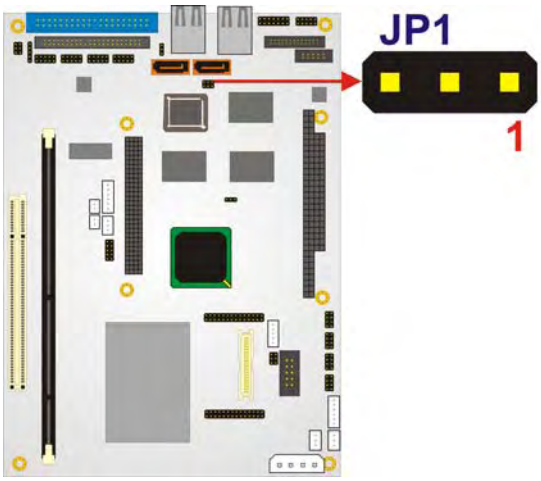


Figure 4-8: COM2 Setup Jumper Pinout Locations

4.5.5 RS-422/485 Jumper

Jumper Label: **JP2**

Jumper Type: 3-pin header

Jumper Settings: See **Table 4-7**

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

The RS-422 or RS-485 jumper allows the COM2 port to be configured as either a RS-422 or RS-485 communications device. This jumper only needs to be set if pin 2 and pin 3 on JP1 were shorted.

JP4	DESCRIPTION
Short 1-2 (Default)	RS-422
Short 2-3	RS-485

Table 4-7: RS-422/485 Jumper Settings

The RS-422 or RS-485 jumper location is shown in **Figure 4-9**.

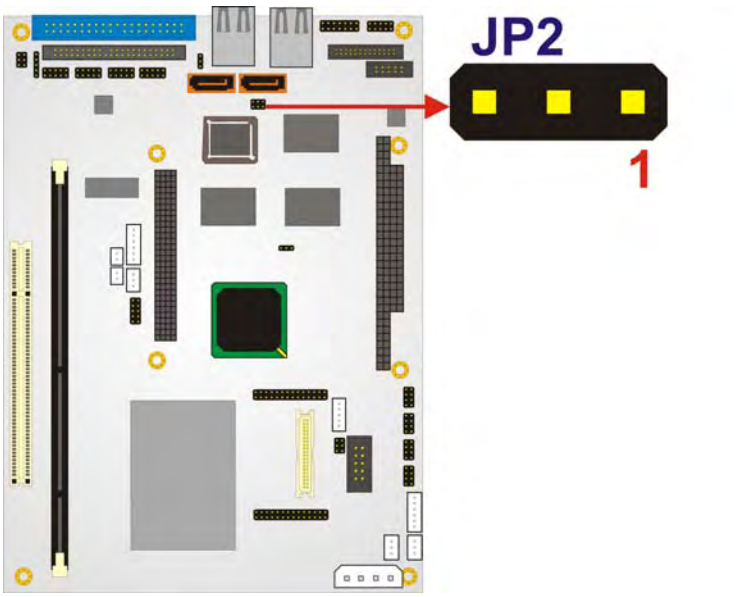


Figure 4-9: RS-422/485 Jumper Pinout Locations

4.5.6 COM2 Voltage Setup Jumper

Jumper Label: **JP5**

Jumper Type: 6-pin header

Jumper Settings: See **Table 4-8**

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

This jumper allows the user to set the voltage for pin 9 on COM2. Pin 9 is traditionally a ring line but this jumper can set pin 9 to supply 5V or 12V power to a serial device connected to COM2. Make the necessary jumper setting in accordance with the settings shown in **Table 4-8**.

JP5	DESCRIPTION
Short 1 - 2 Short 3 – 4	+5V
Short 4 – 6 (Default)	RI#
Short 2 - 4 Short 3 – 5	+12V

Table 4-8: COM2 Voltage Setup Jumper Settings

The COM2 Voltage Setup jumper location is shown in **Figure 4-10** below.

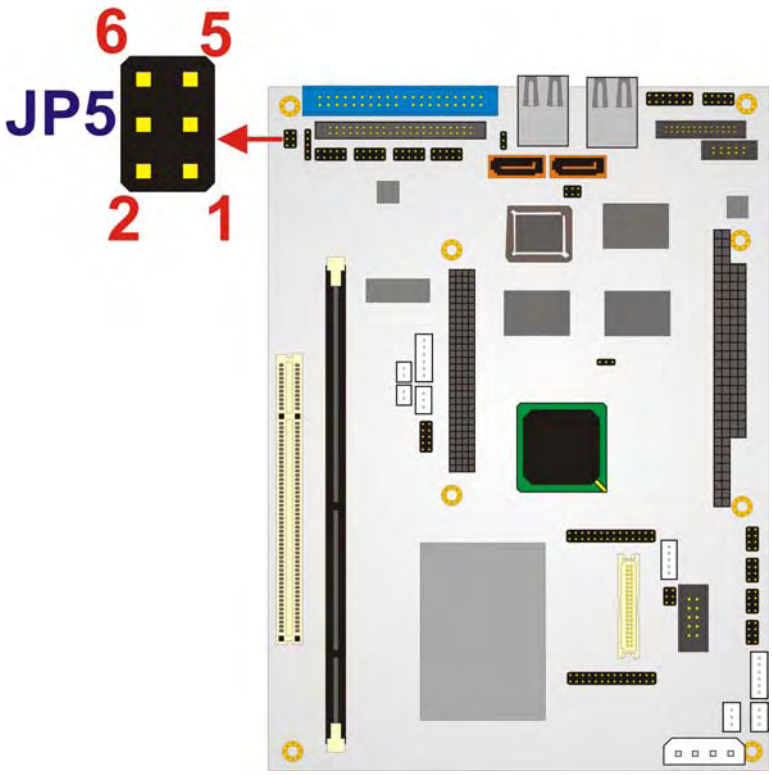


Figure 4-10: COM2 Voltage Setup Jumper Pinout Locations

4.6 Chassis Installation

After the DIMM modules have been installed and after the internal peripheral connectors have been connected to the peripheral devices and the jumpers have been configured, the 3308050 can be mounted into chassis.

To mount a board into a chassis, please refer to the chassis user guide that came with the product.

4.7 Rear Ethernet Connectors

The external RJ-45 connectors can be connected to an external LAN.

Appendix

A

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. GAI support is contacted or the GAI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table B-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

NOTE:

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

```
; INITIAL TIMER PERIOD COUNTER
;
W_LOOP:

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT      15H
 ;
; ADD THE APPLICATION PROGRAM HERE
;
        CMP      EXIT_AP, 1     ;is the application over?
        JNE      W_LOOP         ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT      15H
;
; EXIT ;
```

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Appendix

B

Address Mapping

B.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	VIA Graphics Controller
3C0-3DF	VIA Graphics Controller
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table B-1: IO Address Map

B.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table B-2: 1st MB Memory Address Map

B.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table B-3: IRQ Mapping Table

B.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table B-4: IRQ Mapping Table

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Appendix

C

External AC'97 Audio CODEC

C.1 Introduction

The motherboard comes with an onboard Realtek ALC655 CODEC. Realtek ALC655 is a 16-bit, full duplex AC'97 Rev. 2.3 compatible audio CODECwith a sampling rate of 48KHz.

C.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through a connector on the 3308050 motherboard. Connect the audio kit to the connector.

C.1.2 Driver Installation

After rebooting the sound effect configuration utility appears in the Windows Control Panel (see **Figure C-1**). If the peripheral speakers are properly connected, sound effects should be heard.

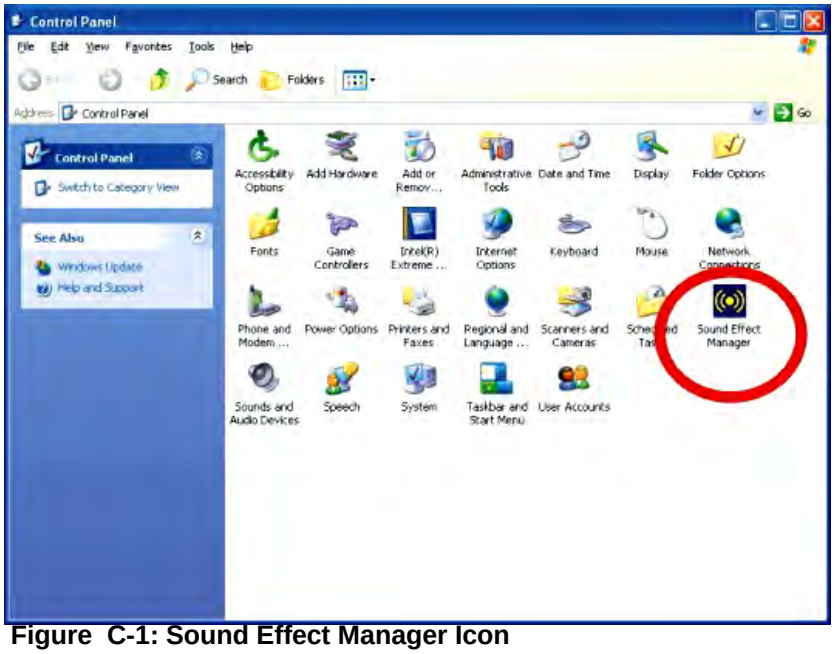

Figure C-1: Sound Effect Manager Icon

C.2 Sound Effect Configuration

C.2.1 Accessing the Sound Effects Manager

To access the **Sound Effects Manager**, please do the following:

Step 1: Install the audio CODEC driver.

Step 2: Click either:

- The Sound Effect Manager icon in the Notification Area of the system task bar (see **Figure C-2**), or
- The Sound Effect Manager icon in the Control Panel (**Figure C-3**).

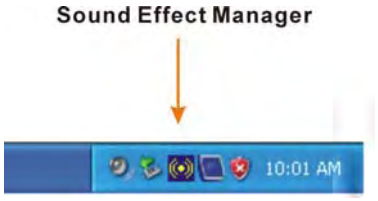

Figure C-2: Sound Effect Manager Icon [Task Bar]

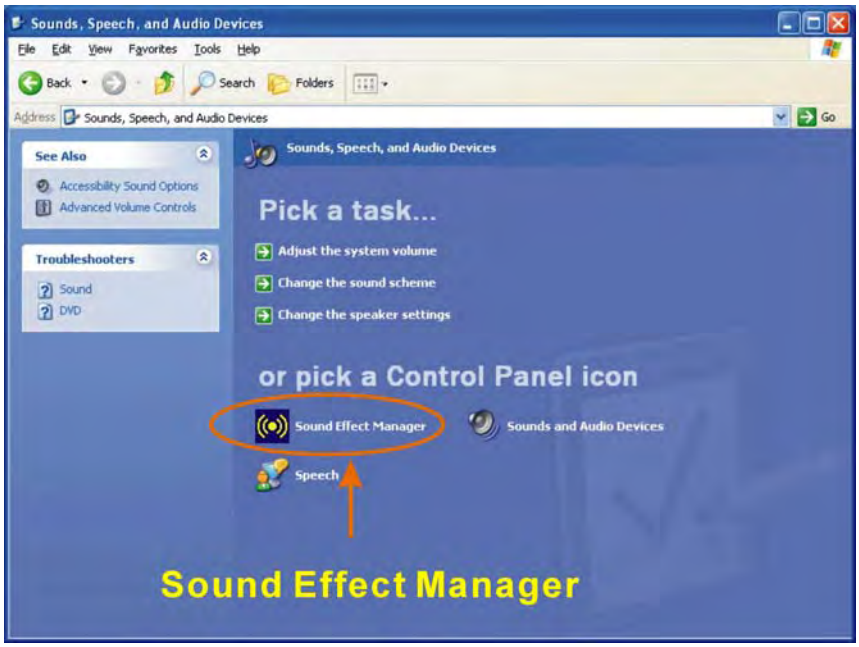

Figure C-3: Sound Effect Manager Icon [Control Panel]

Step 3: The sound effect manager appears. (See **Figure C-4**)

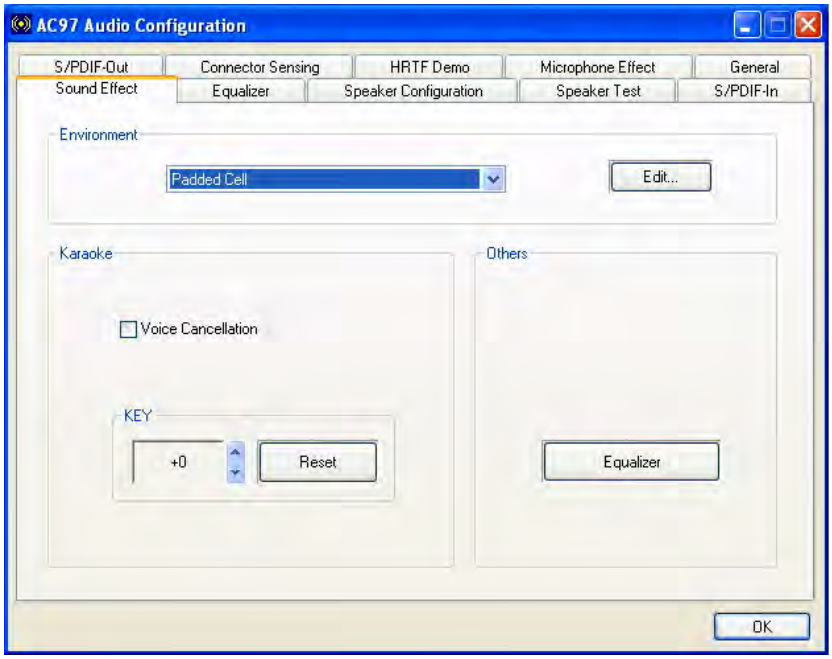

Figure C-4: Sound Effects Manager (ALC655)

NOTE:

The Sound Effect Manager shown in **Figure C-4** is for the RealTek ALC655 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

C.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** in Error! Reference source not found..

NOTE:

The **Karaoke Mode** is configured in the **Sound Effect** menu. To access Karaoke configuration settings, click on the **Sound Effect** menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

NOTE:

Not all RealTek **Sound Effect Managers** have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect***:- Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. To edit the sound effect click "**EDIT**."
- ***Karaoke Mode***:- The **Karaoke Mode** is accessed in the Sound Effect window. The **Voice Cancellation** disables the vocal part of the music being played. The **Key adjustment** up or down arrow icons enables users to define a key that fits a certain vocal range.

- ***Equalizer Selection***:- Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.

- ***Speaker Configuration***:- Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phonejack switch with speakers settings

- ***Speaker Test*:-** Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.

- ***S/PDIF-In & S/PDIF-Out***:- These functions are currently not supported.

- ***Connector Sensing***:- Realtek ALC655 detects if an audio device is plugged into the wrong connector. If an incorrect device is plugged in a warning message appears.

- ***HRTF Demo***:- Adjust HRTF (Head Related Transfer Functions) 3D positional audio here before running 3D applications.

- ***Microphone Effect***:- Microphone noise suppression is enabled in this menu.

- ***General***:- General information about the installed AC'97 audio configuration utility is listed here.

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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