



integration with integrity

User's Manual

Single Board Computer 3301825

Version 1.0, November 2006

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Packing List



NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact Global American, Inc. (GAI) or contact a GAI sales representative directly. To contact a GAI sales representative, please send an email to salesinfo@globalamericaninc.com.

The items listed below should all be included in the 3301825 package.

- „ 1 x 3301825 single board computer
- „ 1 x Audio cable
- „ 1 x IDE flat cable 44p/44p
- „ 2 x 4 COM port cable1 x Mini jumper pack
- „ 1 x Utility CD
- „ 1 x QIG (quick installation guide)

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

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Glossary

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

Chapter

1

Introduction

3301825 3.5" Embedded SBC

1.1 3301825 Overview

The 3.5" 3301825 AMD Geode LX800 low power single board computer (SBC) is fully equipped with advanced multi-mode I/Os. The 3301825 has eight serial ports and a PC/104 for expansion and increased connectivity. The 3301825 is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

1.1.1 3301825 Applications

The 3301825 is designed for applications in the following areas:

- „ Kiosks and Point of Sales
- „ Restaurants
- „ Human Machine Interface (HMI) applications
- „ Marine, GPS and transportation applications
- „ Financial, retail and kiosk applications

1.1.2 3301825 Benefits

Some of the 3301825 benefits include:

- „ Reduced hardware costs
- „ Reduced software costs
- „ Reduced maintenance costs
- „ Client crash prevention
- „ Central resource control
- „ Security protection

1.1.3 3301825 Features

Some of the 3301825 features are listed below:

- „ 3.5" form factor
- „ RoHS compliant
- „ AMD LX-800 processor installed
- „ Dual-independent display functionality

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- „ Low power consumption (6 Watts)
- „ Two high performance 10/100 megabit Ethernet controllers on-board
- „ Two SATA channels with transfer rates up to 150MB/s on-board
- „ Four USB 2.0 devices on-board
- „ Integrated audio

1.2 3301825 Overview

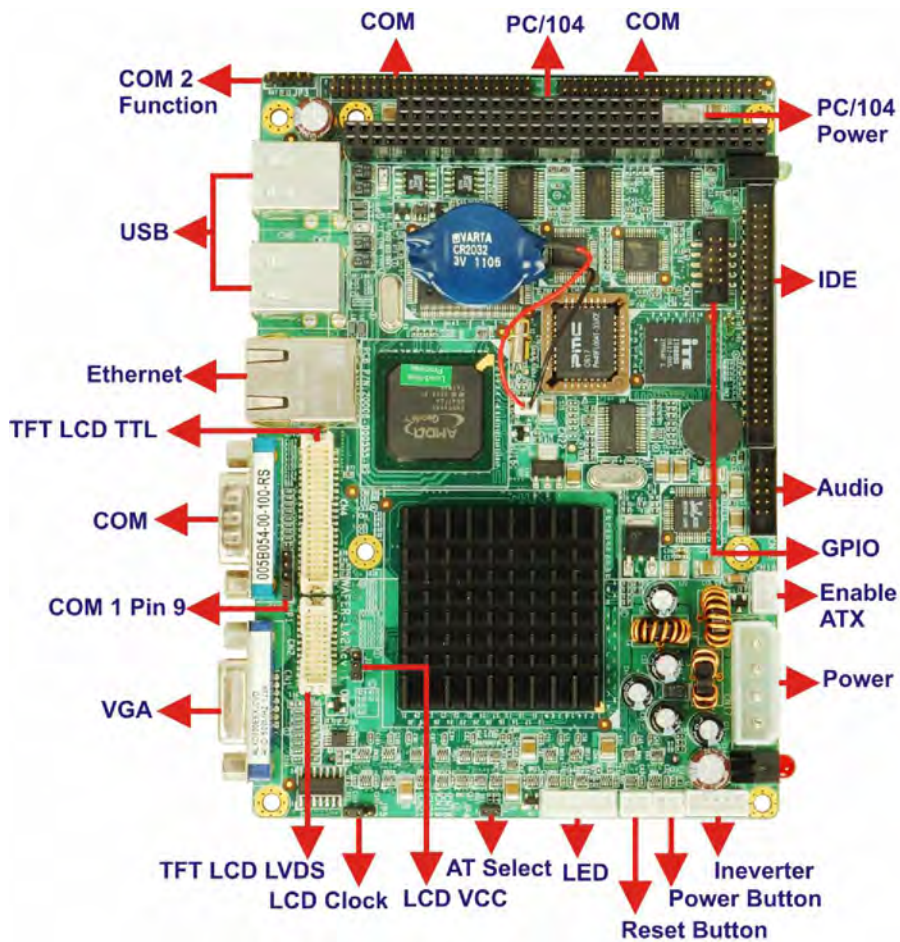


Figure 1-1: 3301825 Overview

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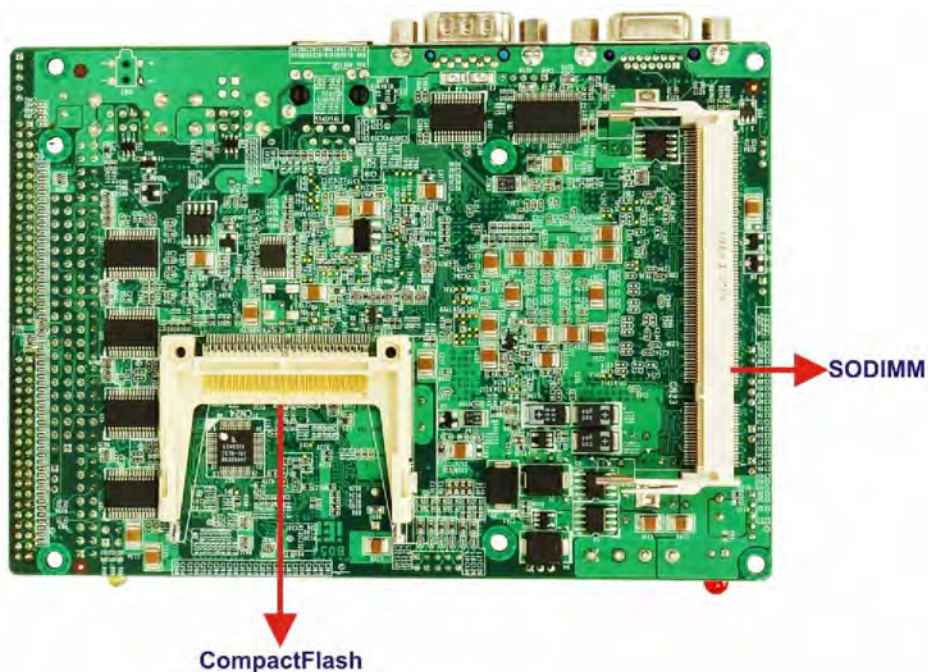


Figure 1-2: 3301825 Solder Side Overview

1.2.1 3301825 Connectors

The 3301825 has the following connectors on-board:

- „ 1 x AT power connector
- „ 1 x ATX power function connector
- „ 1 x Audio connector
- „ 1 x Battery connector
- „ 1 x Compact Flash (CF) connector (solder side)
- „ 1 x External LED connector
- „ 1 x Fan connector
- „ 1 x General purpose input/output (GPIO) connector
- „ 1 x IDE Interface connectors (44-pin)
- „ 1 x Inverter power connector
- „ 1 x Parallel port connector
- „ 1 x PC/104 slot
- „ 1 x PC/104 power connector
- „ 1 x Reset button connector

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- „ 2 x Serial port connectors
- „ 1 x Suspend power input connector
- „ 1 x TFT LCD LVDS interface connector
- „ 1 x TFT LCD TFT interface connector
- „ 1 x SO-DIMM socket

The 3301825 has the following connectors on the board rear panel:

- „ 1 x Ethernet connectors
- „ 2 x Dual USB connector
- „ 1 x Serial port connector
- „ 1 x VGA connector

The 3301825 has the following on-board jumpers:

- „ COM-1 pin-9 signal select
- „ LCD Vcc select
- „ COM-2 function select
- „ AT Power select
- „ LCD clock select

1.2.2 Technical Specifications

3301825 technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2**.

Specification	3301825
Form Factor	3.5" form factor
CPU	AMD® Geode™ LX800 500Mhz
Southbridge Chipset	AMD® Geode™ CS5536
Display	CRT integrated in AMD® Geode™ LX800
TTL/LVDS	24-bit TTL or 18-bit single channel LVDS

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Memory	Supports one 1GB DDR 333/400 200-pin SO-DIMM SDRAM module
BIOS	Award BIOS
SSD	Compact Flash (CF)
Audio	AC'97 Codec Realtek ALC203
LAN	10/100 Base-T dual RTL8100C
COM	Eight RS-232 or Seven RS-232 and one RS-422/RS-485
USB2.0	Four USB 1.1 or USB 2.0 devices supported
IDE	One 44-pin IDE connects to two Ultra ATA33/66/100 device
Watchdog Timer	Software programmable 1-255 sec. by supper I/O
Digital I/O	One GPIO connector
Expansion	One PC/104 slot
Power Supply	+5V \pm 5% AT/ATX power support
Temperature	0°C - 60°C
Humidity (operating)	5%~95% non-condensing
Dimensions	145mm x 102mm
Weight (GW/NW)	670g/230g

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

3301825 3.5" Embedded SBC

2.1 Overview

This chapter describes the specifications and on-board features of the 3301825 in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are listed below:

- „ **Length:** 146.06mm
- „ **Width:** 102mm

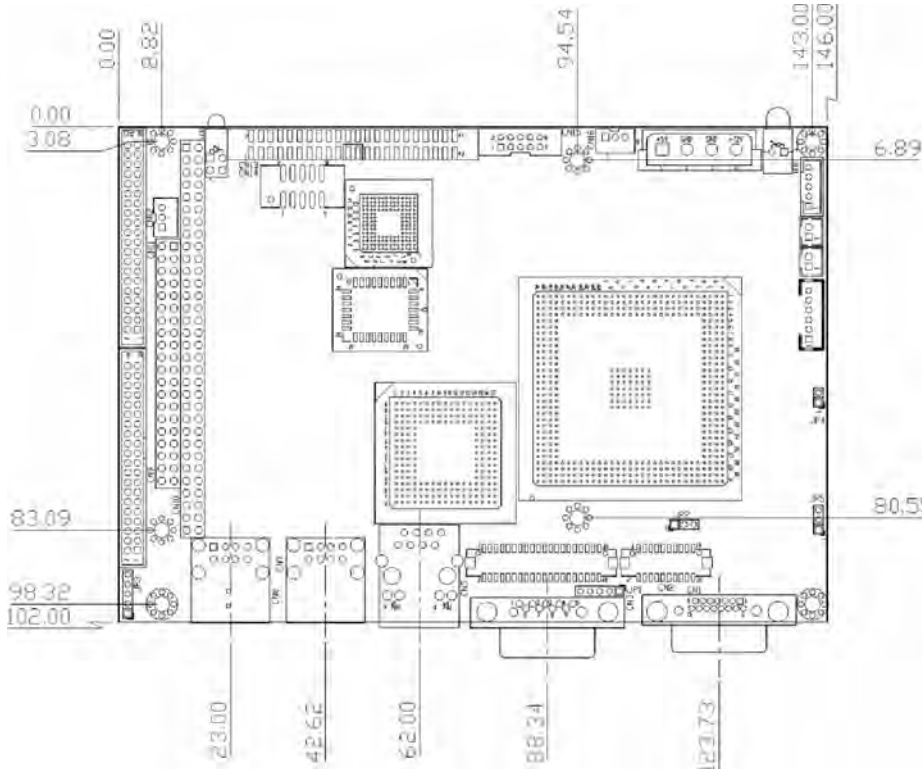


Figure 2-1: 3301825 Dimensions (mm)

2.2.2 External Interface Panel Dimensions

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

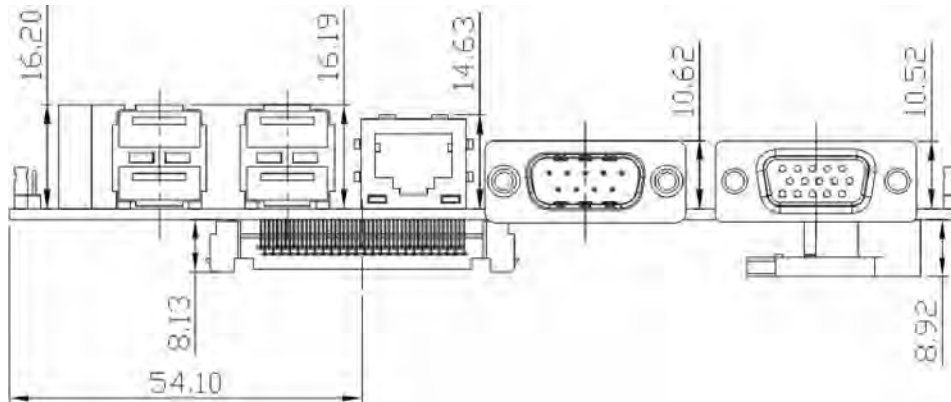


Figure 2-2: External Interface Panel Dimensions (mm)

2.3 Data Flow

The 3301825 motherboard comes with an AMD® Geode™ LX800 CPU and an AMD® Geode™ CS5536 linked together by the GeodeLink™ Interface Unit. **Figure 2-3** shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

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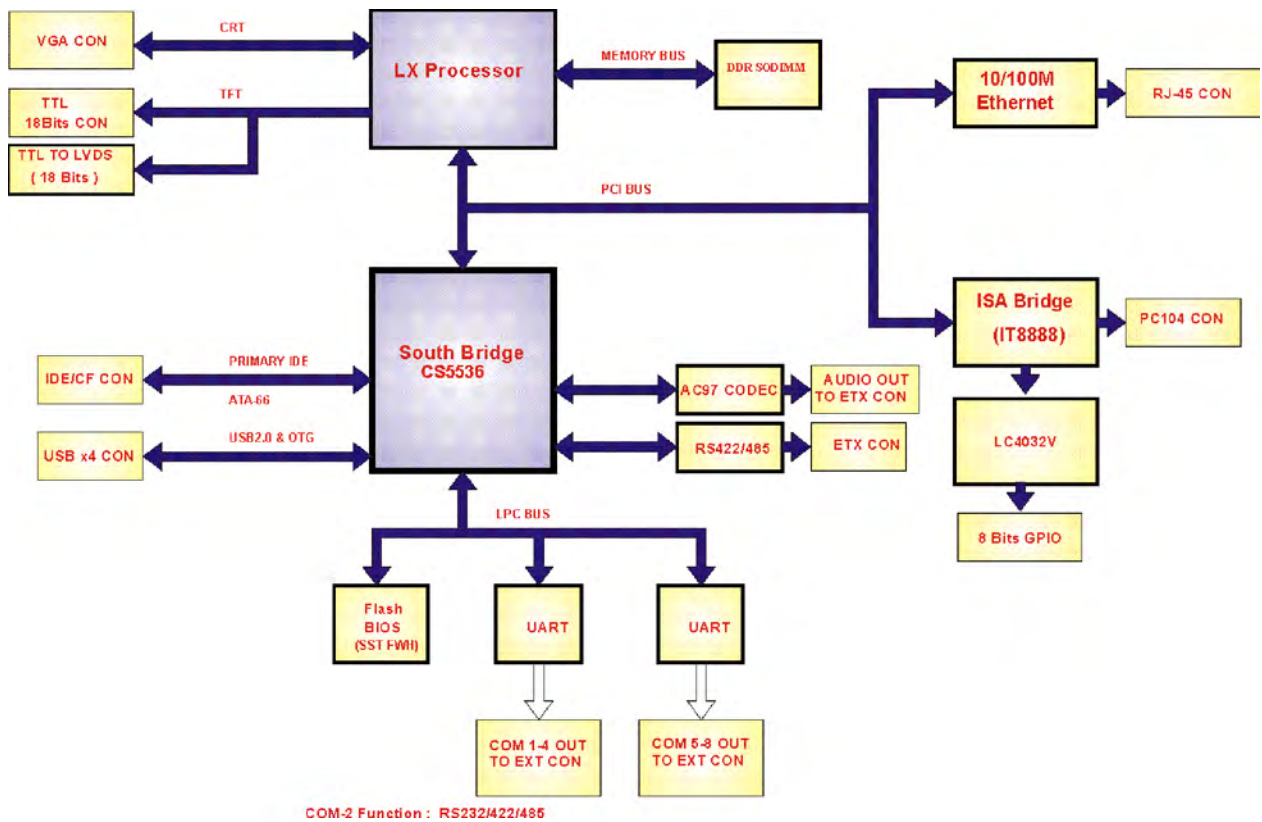


Figure 2-3: Data Flow Block Diagram

2.4 CPU Support

The 3301825 series motherboards all come with a preinstalled AMD® Geode™ LX 800 500MHz CPU.

2.4.1 AMD® Geode™ LX 800 500MHz Overview

The specifications for the 500MHz AMD® Geode™ LX 800 are listed below

- „ x86/x87-compatible core
- „ Processor frequency up to 500 MHz
- „ 64K I/64K D L1 cache and 128K L2 cache
- „ Split I/D cache/TLB (Translation Look-Aside Buffer)
- „ Integrated FPU that supports the Intel MMX® and AMD 3DNow!™ Technology instruction sets
- „ 9 GB/s internal GeodeLink™ Interface Unit (GLIU)

- „ Security Block
 - 128-bit AES (CBC/ECB)
- „ True Random Number Generator

2.4.2 AMD® Geode™ LX 800 Memory Support

The AMD® Geode™ LX 800 supports 64-bit DDR memory modules with frequencies up to 400MHz. The 3301825 has one 200-pin DDR SO-DIMM SDRAM socket that supports one 64-bit 333 MHz or 400MHz DDR SO-DIMM memory module with a maximum capacity of 1GB.

2.4.3 AMD® Geode™ LX 800 500MHz Display Support

The AMD® Geode™ LX 800 supports both CRT and TFT in a dual display mode. The following display specifications.

- „ Supported Standards
 - High Definition (HD)
 - Standard Definition (SD)
- „ Supported Resolution
 - 1920x1440 in CRT mode
 - 1600x1200 in TFT mode
- „ VESA 1.1 and 2.0 VIP/VDA support

2.4.4 AMD® Geode™ LX 800 500MHz Graphics processor

The AMD® Geode™ LX 800 BitBLT/vector engine graphics processor supports pattern generation, source expansion, pattern/source transparency, 256 ternary raster operations, alpha blenders to support alpha- BLTs, incorporated BLT FIFOs, a GeodeLink interface and the ability to throttle BLTs according to video timing. New features added to the Graphics Processor include:

- „ Command buffer interface
- „ Hardware accelerated rotation BLTs
- „ Color depth conversion
- „ Paletized color

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- „ Full 8x8 color pattern buffer
- „ Separate base addresses for all channels
- „ Monochrome inversion

Table 2-1: Geode LX Graphics Features lists a complete list of Geode LX graphics features. For more details, please refer to the AMD website or the Geode LX series data book available from AMD.

Feature	AMD Geode™ LX Processor
Color Depth	8, 16, 32 bpp (A) RGB 4 and 8-bit indexed
ROPs	256 (2-src, dest and pattern)
BLT Buffers	FIFOs in Graphics Processor
BLT Splitting	Managed by hardware
Video Synchronized BLT/Vector	Throttle by VBLANK
Bresenham Lines	Yes
Patterned (stippled) Lines	Yes
Screen to Screen BLT	Yes
Screen to Screen BLT with mono expansion	Yes
Memory to Screen BLT	Yes (throttled rep movs writes)
Accelerated Text	No
Pattern Size (Mono)	8x8 pixels
Pattern Size (Color)	8x8 pixels
Monochrome Pattern	Yes (with inversion)
Dithered Pattern (4 color)	No
Color Pattern	8, 16, 32 bpp
Transparent Pattern	Monochrome
Solid Fill	Yes
Pattern Fill	Yes
Transparent Source	Monochrome
Color Key Source Transparency	Y with mask
Variable Source Stride	Yes
Variable Destination Stride	Yes
Destination Write Bursting	Yes
Selectable BLT Direction	Vertical and Horizontal

Alpha BLT	Yes (constant α , α/pix , or sep. α channel)
VGA Support	Decodes VGA Register
Pipeline Depth	Unlimited
Accelerated Rotation BLT	8, 16, 32 bpp
Color Depth Conversion	5:6:5, 1:5:5:5, 4:4:4:4, 8:8:8:8

Table 2-1: Geode LX Graphics Features

2.4.5 AMD[®] Geode[™] LX 800 500MHz Power Management

The power management for the 500MHz AMD[®] Geode[™] LX 800 is listed below:

- „ 1.8W Typical (3.9W TDP) @ 500MHz
- „ GeodeLink active hardware power management
- „ Hardware support for standard ACPI software power management
- „ I/O companion SUSP#/SUSPA# power controls
- „ Lower power I/O
- „ Wakeup on SMI/INTR

2.5 System Chipset

The 3301825 series motherboards all have a preinstalled AMD[®] Geode[™] CS5536 system chipset. The system chipset features are listed below.

- „ 82xx Legacy Devices
- „ System Management Bus (SMB) Controller
- „ 8 Multi-Function General Purpose Timers (MFGPTs)
- „ Power Management Controller
- „ ACPI v2.0 compliant

2.5.1 GeodeLink[™] Interface Unit

- 64-bit, 66MHz operation
- PCI VSM (Virtual System Module) that makes the interface transparent to applications software and BIOS
- Programmable routing descriptors, use and activity monitors, and SSMI (Synchronous System Management Interrupt)

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2.5.2 AMD® Geode™ CS5536 ATA-6 Controller

The single 3301825 IDE connector supports two ATA-6 HDDs. An ATA-6 (Ultra ATA/100) compliant IDE controller on the AMD® Geode™ CS5536 has a maximum transfer rate of 100MB/s. ATA-6 includes advancements in error checking and ATA-6 drives are compatible with future interface additions.

The onboard ATA-6 controller is able to support the following IDE HDDs:

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

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/100
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 3 - 4	UDMA 3 – 4	UDMA 2
DMA/UDMA Max Transfer	100MB/s	66MB/s	33MB/s
Controller Interface	5V	5V	5V

Table 2-2: Supported HDD Specifications

2.5.3 AMD® Geode™ CS5536 Audio Codec 97 (AC'97) Controller

The AC'97 specification v2.3 compliant controller on the chipset is interfaced to a 20-bit DAC and 18-bit ADC full-duplex AC'97 2.3 stereo RealTek ALC203 codec. The ALC203 is then connected to a 10-pin audio connector to which an audio kit can easily be connected. The codec meets performance requirements for audio on PC99/2001 systems. Some of the codec features are listed below.

- „ Meets Microsoft WHQL/WLP 2.0 audio requirements
- „ 20-bit DAC and 18-bit ADC resolution

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- „ 18-bit Stereo full-duplex CODEC with independent and variable sampling rate
- „ Complies with AC'97 2.3 specifications
 - LINE/HP-OUT, MIC-IN and LINE-IN sensing
 - 14.318MHz -> 24.576MHz PLL saves crystal
 - 12.288MHz BITCLK input can be consumed
 - Integrated PCBEEP generator to save buzzer
 - Interrupt capability
 - Page registers and Analog Plug & Play
- „ Support of S/PDIF out is fully compliant with AC'97 rev2.3 specifications
- „ 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 input: PCBEEP, PHONE-IN
- „ Supports double sampling rate (96KHz) of DVD audio playback
- „ Two software selectable MIC inputs
- „ +6/12/20/30dB boost preamplifier for MIC input
- „ Stereo output with 6-bit volume control
- „ Mono output with 5-bit volume control
- „ Headphone output with 50mW/20Ohm amplifier
- „ 3D Stereo Enhancement
- „ Multiple CODEC extension capability
- „ External Amplifier Power Down (EAPD) capability
- „ Power management and enhanced power saving features
- „ Stereo MIC record for AEC/BF application
- „ DC Voltage volume control
- „ Auxiliary power to support Power Off CD
- „ Adjustable VREFOUT control
- „ 2 GPIO pins with smart GPIO volume control
- „ 2 Universal Audio Jacks (UAJ)® for front panel
- „ Supports 32K/44.1K/48K/96KHz S/PDIF output
- „ 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

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- „ A3D™ compatible
- „ I3DL2 compatible
- „ HRTF 3D Positional Audio
- „ Sensaura™ 3D Enhancement (optional)
- „ 10 Bands of Software Equalizer
- „ Voice Cancellation and Key Shifting in Karaoke mode
- „ AVRack® Media Player

2.5.4 AMD® Geode™ CS5536 Flash Interface

The 3301825 CompactFlash socket supports standard CF Type I and CF Type II cards. The chipset flash interface is multiplexed with an IDE interface and can be connected to an array of industry standard NAND Flash or NOR Flash devices.

2.5.5 AMD® Geode™ CS5536 USB Controller

Four external USB ports on the 3301825 board are interfaced to the chipset USB controller. Four USB 1.1 or USB 2.0 devices can be connected simultaneously to the 3301825. The chipset USB controller has the following specifications:

- 4 USB ports
- USB 1.1 and USB 2.0 compliant
- 3 host ports
- 1 host/device

2.5.6 AMD® Geode™ CS5536 Serial Communications

Eight high-speed UART serial port connectors, seven RS-232 and one that can be configured as RS-232, RS-422 or RS-485, are connected to the system chipset low pin count (LPC) port via the LPC bus. The specifications for the serial ports are listed below.

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

2.5.7 AMD® Geode™ CS5536 Real Time Clock

The system chipset has a battery backed up 256-byte real-time clock (RTC) with CMOS RAM.

2.5.8 BIOS

The BIOS flash memory chip on the 3301825 has a licensed copy of AWARD BIOS loaded onto it. The BIOS flash memory chip is connected to the chipset via the LPC bus.

The flash BIOS features are listed below:

- „ SMIBIOS (DMI) compliant
- „ Console redirection function support
- „ PXE (**P**re-**B**oot **E**xecution **E**nvironment) support
- „ USB booting support

2.6 GeodeLink™ PCI Bridge

2.6.1 Overview

The GeodeLink™ PCI Bridge (GLPCI) module provides a PCI interface for GeodeLink Interface Unit-based designs. The GLPCI module is composed of six major blocks:

- „ GeodeLink Interface
- „ FIFO/Synchronization
- „ Transaction Forwarding
- „ PCI Bus Interface
- „ PCI Arbiter

The GeodeLink and PCI Bus Interface blocks provide adaptation to the respective buses. The Transaction Forwarding block provides bridging logic. Some of the features of the GeodeLink™ PCI Bridge are listed below:

- „ PCI Version 2.2 compliance
- „ 32-bit, 66 MHz PCI bus operation
- „ Target support for fast back-to-back transactions
- „ Arbiter support for three external PCI bus masters

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- „ Write gathering and write posting for in-bound write requests
- „ Virtual PCI header support
- „ Delayed transactions for in-bound read requests
- „ Zero wait state operation within a PCI burst
- „ Dynamic clock stop/start support for GLIU and PCI clock domains (this is not CLKRUN support)
- „ Capable of handling out of bound transactions immediately after reset

2.6.2 10/100M Ethernet

A highly integrated and cost-effective single-chip, fast RealTek RTL8100C 10/100M Ethernet controller is interfaced through first the PCI bus and then through the GeodeLink™ PCI Bridge to the CPU and system chipset. The RealTek RTL8100C controller provides 10Mbps or 100Mbps Ethernet connectivity to the 3301825. Some of the features of the RealTek RTL8100C are listed below.

- „ 10Mbps and 100Mbps operation
- „ Supports 10Mbps and 100Mbps N-way auto-negotiation
- „ Supports 25MHz Crystal or 25MHz OSC as the internal clock source
- „ Complies with PC99/PC2001 standards
- „ Supports ACPI power management
- „ Provides PCI bus master data transfer
- „ Provides PCI memory space or I/O space mapped data transfer
- „ Supports PCI clock speed of 16.75MHz-40MHz
- „ Advanced power saving mode
- „ Supports Wake-on-LAN and remote wake-up (AMD Magic Packet™, Link Change, and Microsoft® Wake-up frame)
- „ Half/Full duplex capability
- „ Supports Full Duplex Flow Control (IEEE 802.3x)
- „ Provides interface to 93C46 EEPROM to store resource configuration and ID parameters
- „ Provides PCI clock run pin
- „ Provides LED pins for network operation status indication
- „ 2.5/3.3V power supply with 5V tolerant I/Os

2.6.3 PCI to ISA Bridge

An ITE IT8888G PCI to ISA bridge single function device connects the onboard 3301825 ISA bus PC/104 connector and the GPIO connector to the GeodeLink™ PCI bridge. The IT8888G has a PCI specification v2.1 compliant 32-bit PCI bus interface and supports both PCI Bus master and slave. The PCI interface supports both programmable positive and full subtractive decoding schemes. Some of the features of the IT8888G PCI to ISA bridge are listed below.

- „ PCI Interface
- „ Programmable PCI Address Decoders
- „ PC/PCI DMA Controller
- „ Distributed DMA Controller
- „ ISA Interface
- „ SM Bus
- „ 1 analog line-level mono output: MONO_OUT
- „ Power-on Serial Bus Configuration
- „ Serial IRQ
- „ Versatile power-on strapping options
- „ Supports NOGO function
- „ Single 33 MHz Clock Input
- „ +3.3V PCI I/F with +5V tolerant I/O buffers
- „ +5V ISA I/F and core Power Supply

2.7 Environmental and Power Specifications

2.7.1 System Monitoring

The 3301825 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)

2.7.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the 3301825 are listed below.

- „ Minimum Operating Temperature: 0°C (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.

2.7.3 Power Consumption

Table 2-3 shows the power consumption parameters for the 3301825 when an AMD Geode LX 800 processor is running with one 512MB DDR333 memory module.

	Current
+5V	1.33A

Table 2-3: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the 3301825 may result in permanent damage to the 3301825 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3301825. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 3301825, 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 3301825, place it on an anti-static pad. This reduces the possibility of ESD damaging the 3301825.
- „ ***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 3301825 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 3301825 does not fall out of the box.
- „ Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist



NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Global American, Inc. (GAI) or contact a GAI sales representative directly. To contact a GAI sales representative, please send an email to salesinfo@globalamericaninc.com.

3.3.1 Package Contents

The 3301825 is shipped with the following components:

Quantity	Item	Image
1	3301825	A photograph of the 3301825 Embedded SBC, a green printed circuit board with various components including a blue capacitor, a black heat sink, and several connectors.
1	Audio Cable	A photograph of an audio cable with a white braided outer sheath, a multi-pin connector on one end, and a 3.5mm stereo jack on the other.

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1	IDE cable	 An IDE cable with a blue connector on one end and a black connector on the other, with a white ribbon cable in the middle.
2	4 COM Port Cable	 A white ribbon cable with four gold-plated DB-9 connectors on the end.
1	mini jumper Pack	 A collection of blue plastic mini jumpers of various sizes and shapes.
1	Quick Installation Guide	
1	Utility CD	

Table 3-1: Package List Contents

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.2 shows peripheral interface connector locations. Section 4.1.2 lists all the peripheral interface connectors seen in Section 4.1.2.

4.1.1 3301825 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

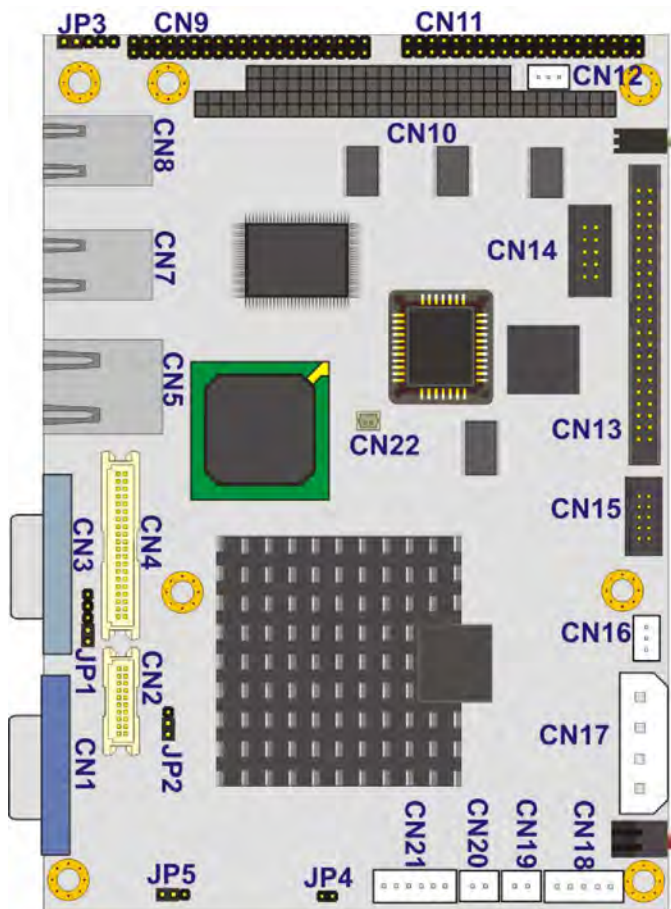


Figure 4-1: Connector and Jumper Locations

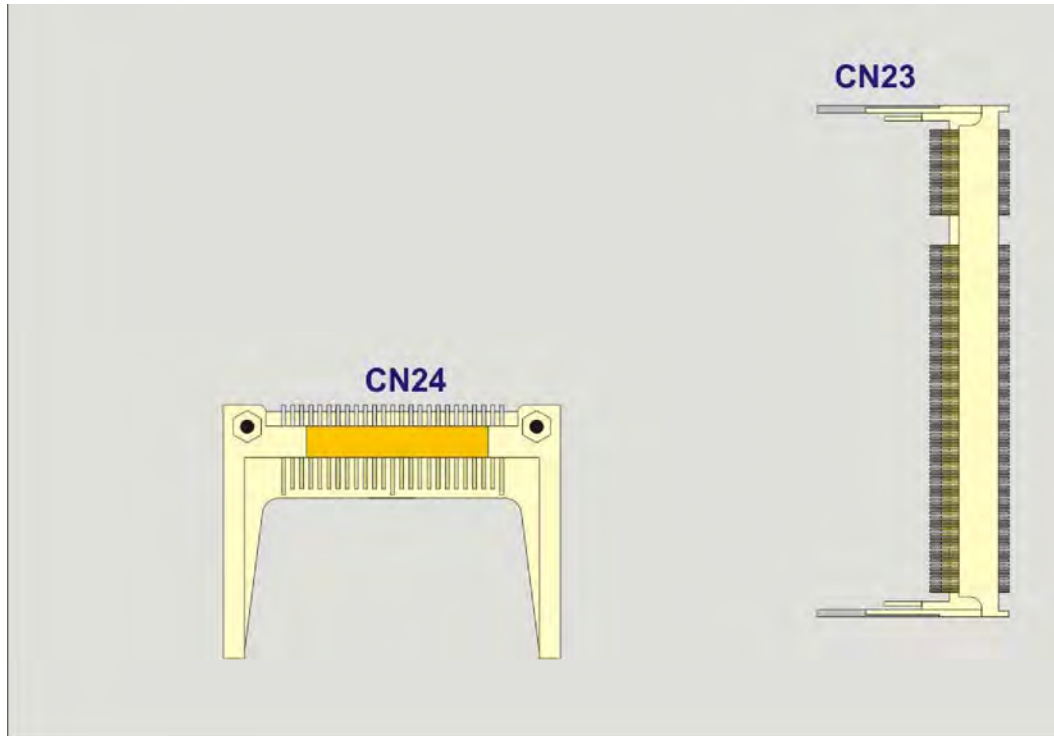


Figure 4-2: Connector and Jumper Locations (Solder Side)

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the 3301825. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
AT power connector	4-pin header	CN17
ATX enable connector	3-pin header	CN16
Power button connector	2-pin header	CN19
Audio connector	10-pin header	CN15
Battery connector	2-pin header	CN22
Compact Flash (CF) connector	50-pin header	CN24

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GPIO connector	10-pin header	CN14
IDE Interface connector	44-pin header	CN13
Inverter power connector	5-pin header	CN18
LED connector	6-pin header	CN21
PC/104 power input connector	3-pin header	CN10
PC/104 slot	104-pin slot	CN12
Reset button connector	2-pin header	CN20
Serial port connector (COM 2 – COM 4)	40-pin header	CN9
Serial port connector (COM 5 – COM 8)	40-pin header	CN11
TFTLCD LVDS connector	20-pin header	CN2
TFT LCD TTL connector	40-pin header	CN4

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the 3301825. Detailed descriptions of these connectors can be found in **Section 4.3** on **page 55**.

Connector	Type	Label
Ethernet connector	RJ-45	CN5
RS-232 serial port connector	9-pin male	CN3
USB port	USB port	CN7
USB port	USB port	CN8
VGA port connector	15-pin female	CN1

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 3301825.

4.2.1 AT Power Connector

CN Label:	CN17
CN Type:	4-pin AT power connector (1x4)
CN Location:	See Figure 4-3
CN Pinouts:	See Table 4-3

The 4-pin AT power connector is connected to an AT power supply.

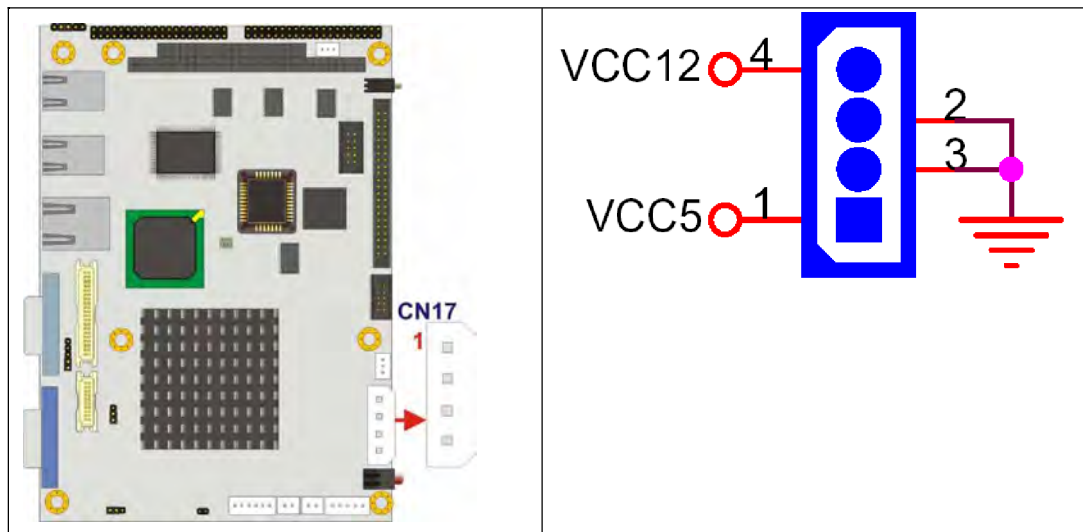


Figure 4-3: AT Power Connector Location

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

Table 4-3: AT Power Connector Pinouts

4.2.2 ATX Power Supply Enable Connector

- CN Label:** CN16
- CN Type:** 3-pin wafer (1x3)
- CN Location:** See Figure 4-4
- CN Pinouts:** See Table 4-4

The ATX power supply enable connector enables the 3301825 to be connected to an ATX power supply. In default mode, the 3301825 can only use 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.

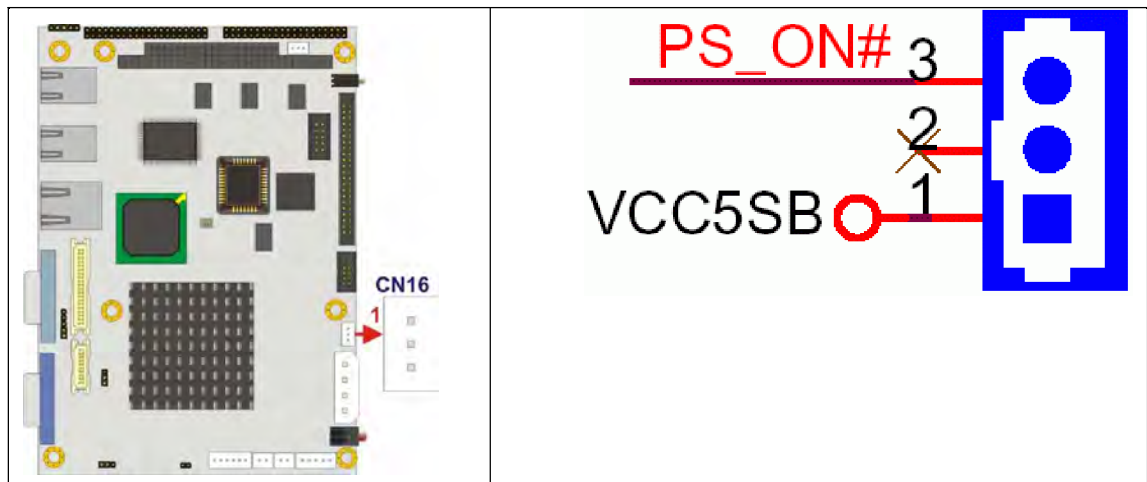


Figure 4-4: ATX Power Supply Enable Connector Location

PIN NO.	DESCRIPTION
1	+5VSB
2	NC
3	PSON#

Table 4-4: ATX Power Supply Enable Connector Pinouts

4.2.3 Audio Connector (10-pin)

- CN Label:** CN15
- CN Type:** 10-pin header
- CN Location:** See Figure 4-5
- CN Pinouts:** See Table 4-5

The 10-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.

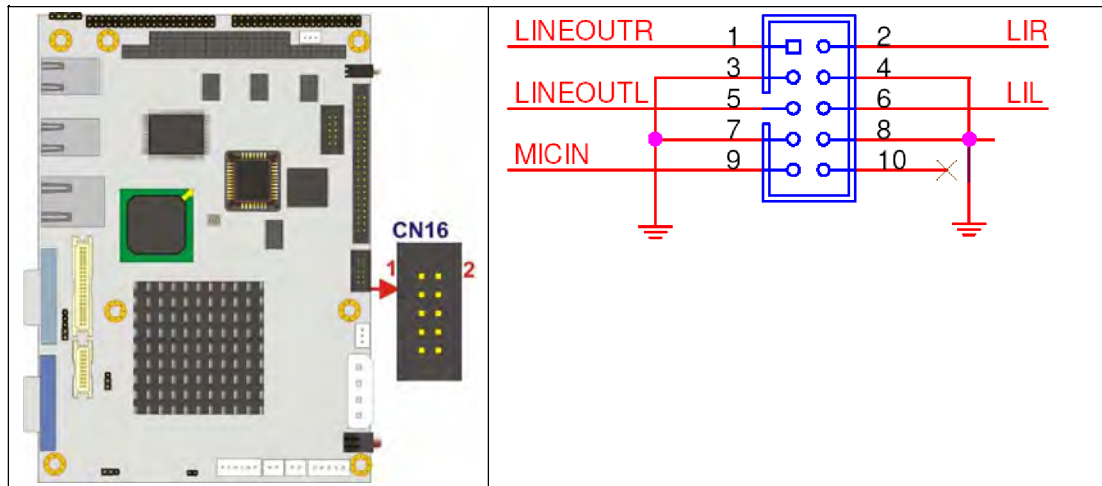


Figure 4-5: Audio Connector Pinouts (10-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Line out R	2	Line in R
3	GND	4	GND

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5	Line out L	6	Line in L
7	GND	8	GND
9	MIC in	10	NC

Table 4-5: Audio Connector Pinouts (10-pin)

4.2.4 Backlight Inverter Connector

CN Label:	CN18
CN Type:	5-pin wafer (1x5)
CN Location:	See Figure 4-6
CN Pinouts:	See Table 4-6

The backlight inverter connector provides the backlight on the LCD display connected to the 3301825 with +12V of power.

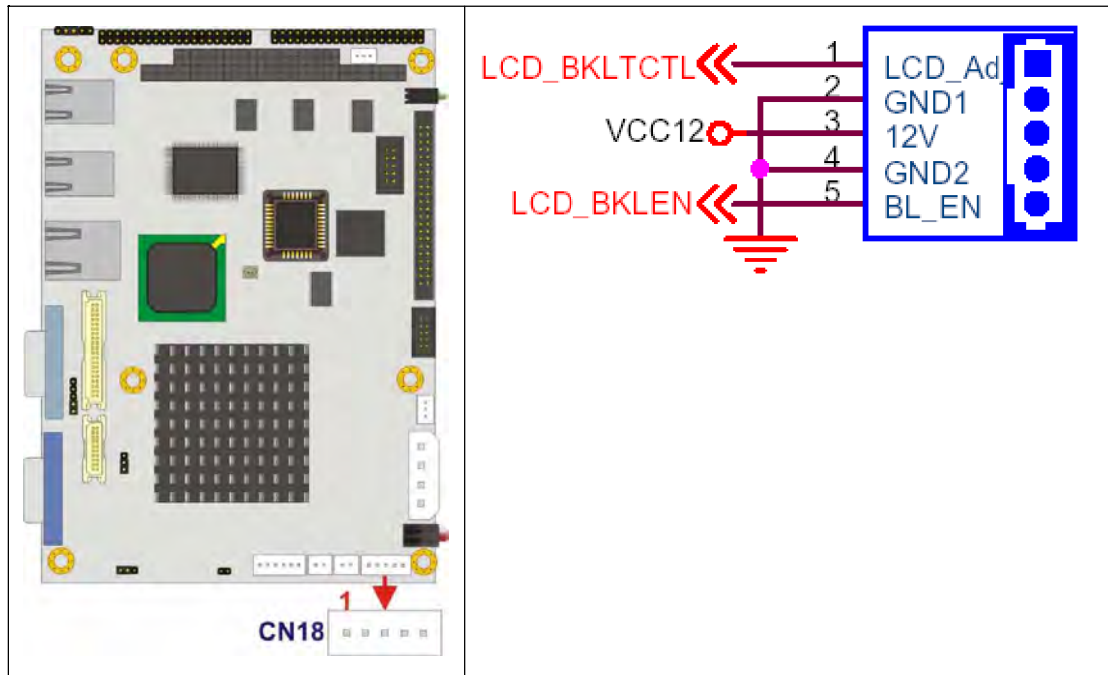


Figure 4-6: Panel Backlight Connector Pinout Locations

PIN NO.	DESCRIPTION
1	LCD_Adj
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT ENABLE

Table 4-6: Panel Backlight Connector Pinouts

4.2.5 Battery Connector

- CN Label:** CN22
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See Figure 4-7
- CN Pinouts:** See Table 4-7

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.

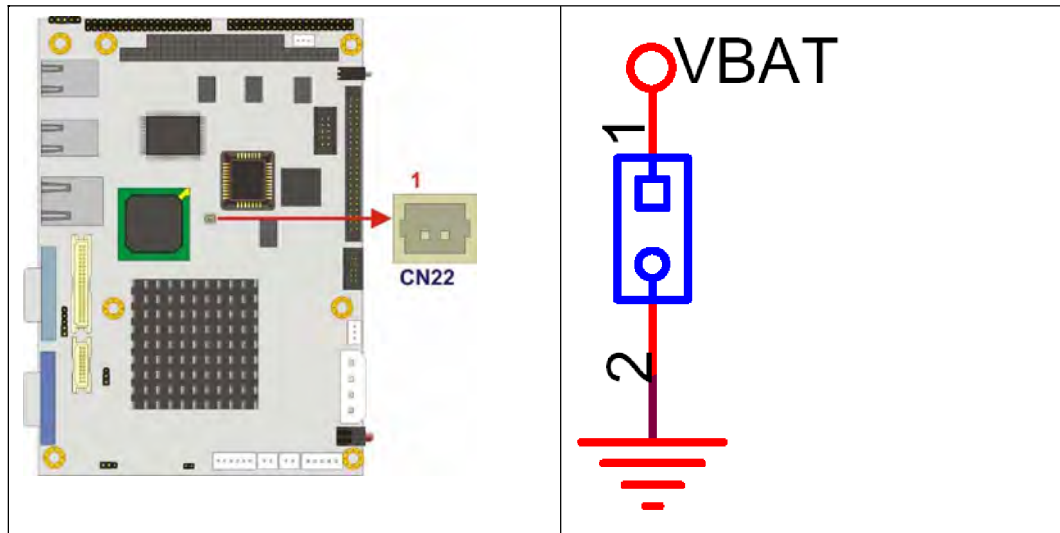


Figure 4-7: Battery Connector Location

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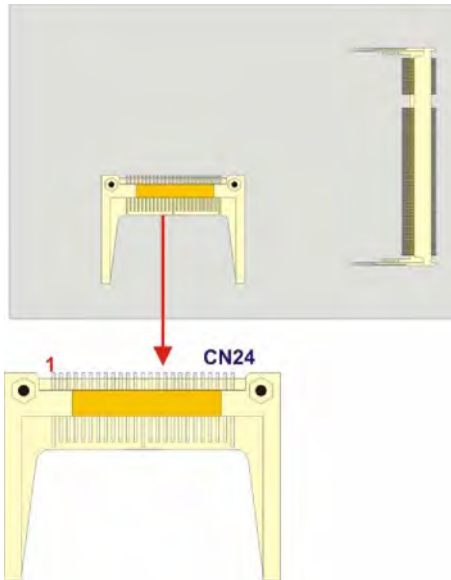
PIN NO.	DESCRIPTION
1	Battery+
2	Ground

Table 4-7: Battery Connector Pinouts

4.2.6 Compact Flash Socket

- CN Label:** CN24 (solder side)
- CN Type:** 50-pin header (2x25)
- CN Location:** See Figure 4-8
- CN Pinouts:** See Table 4-8

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the 3301825.



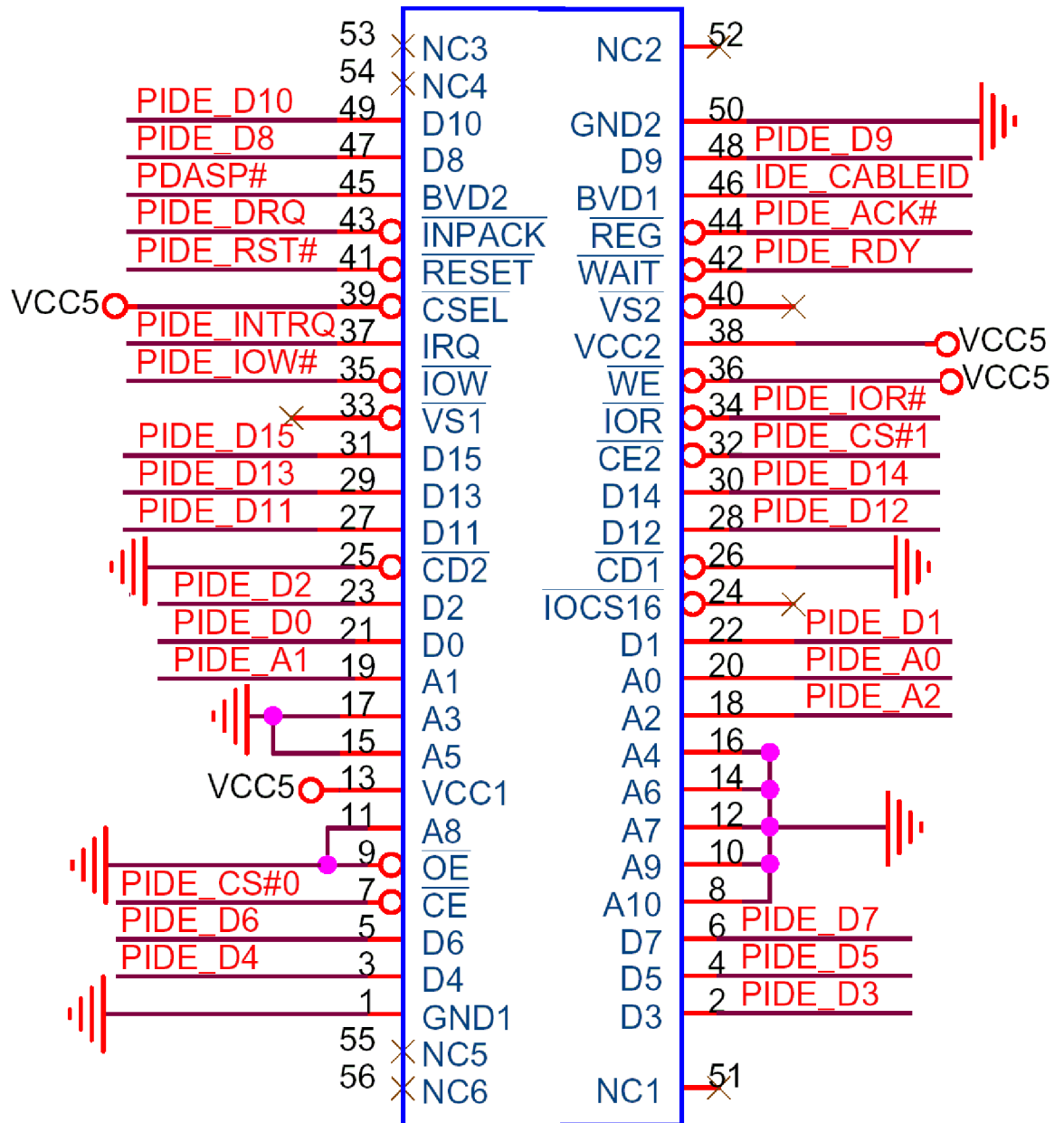


Figure 4-8: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
49	PIDE_D10	50	Ground
47	PIDE_D8	48	PIDE_D9
45	PDASP#	46	IDE_CABLEID
43	PIDE_DRQ	44	PIDE_ACK#

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41	PIDE_RST#	42	PIDE_RDY
39	VCC5	40	N/C
37	PIDE_INTRO	38	VCC5
35	PIDE_IOW#	36	VCC5
33	N/C	34	PIDE_IOR#
31	PIDE_D15	32	PIDE_CS#1
29	PIDE_13	30	PIDE_D14
27	PIDE_D11	28	PIDE_D12
25	Ground	26	Ground
23	PIDE_D2	24	N/C
21	PIDE_D0	22	PIDE_D1
19	PIDE_A1	20	PIDE_A0
17	Ground	18	PIDE_A2
15	Ground	16	Ground
13	VCC5	14	Ground
11	Ground	12	Ground
9	Ground	10	Ground
7	PIDE_CS#0	8	Ground
5	PIDE_D6	6	PIDE_D7
3	PIDE_D4	4	PIDE_D5
1	Ground 1	2	PIDE_D3

Table 4-8: CF Card Socket Pinouts

4.2.7 GPIO Connector

- CN Label:** CN14
- CN Type:** 10-pin header (2x5)
- CN Location:** See **Figure 4-9**
- CN Pinouts:** See **Table 4-9**

The GPIO connector can be connected to external I/O control devices including sensors, lights, alarms and switches.

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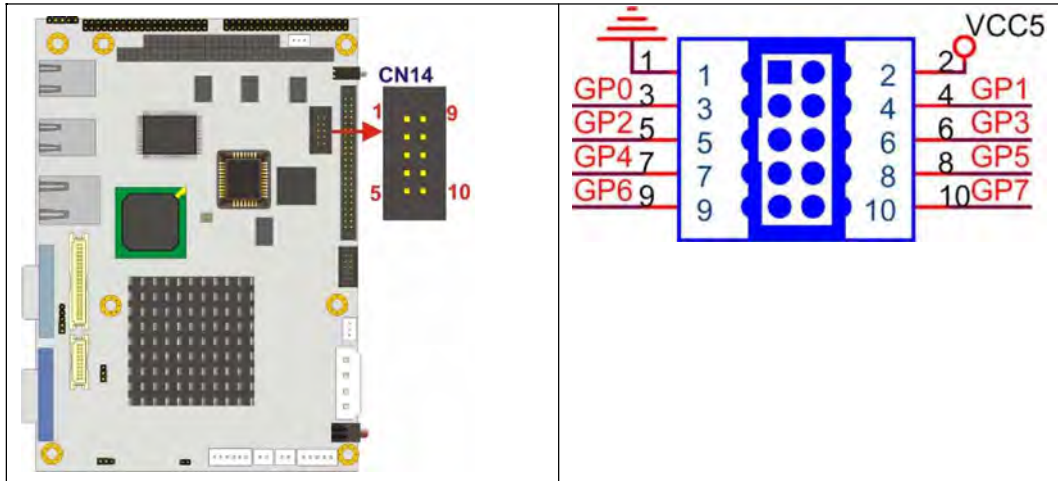


Figure 4-9: GPIO Connector Pinout Locations

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 4-9: GPIO Connector Pinouts

4.2.8 IDE Connector(44-pin)

- CN Label:** CN13
- CN Type:** 44-pin header (2x22)
- CN Location:** See Figure 4-10
- CN Pinouts:** See Table 4-10

One 44-pin IDE device connector on the 3301825 supports connectivity to two hard disk drives.

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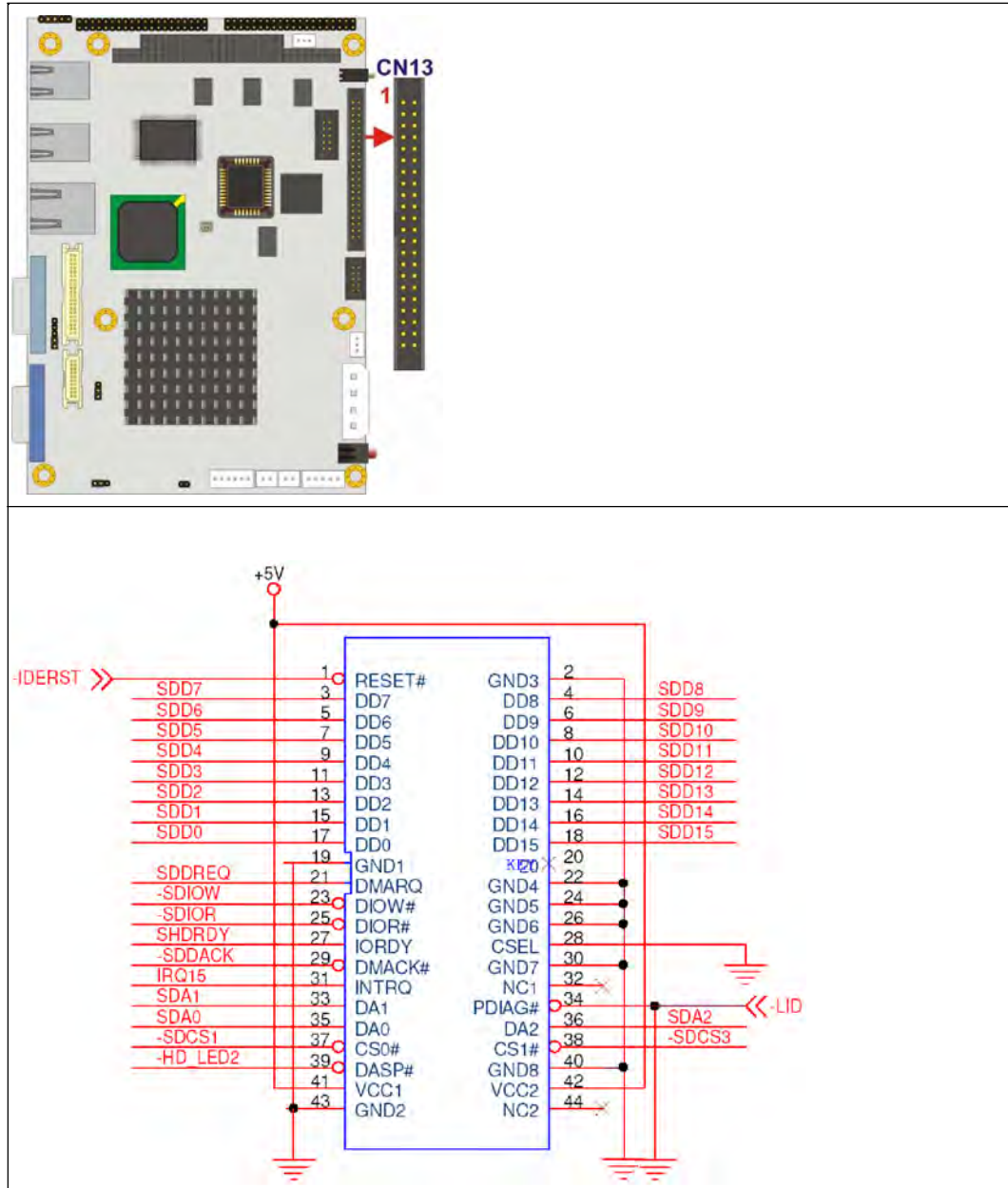


Figure 4-10: Secondary IDE Device Connector Locations

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 4-10: Secondary IDE Connector Pinouts

4.2.9 LED Connector

- CN Label:** CN21
- CN Type:** 6-pin wafer (1x6)
- CN Location:** See **Figure 4-11**
- CN Pinouts:** See **Table 4-11**

The LED connector connects to an HDD indicator LED and a power LED on the system chassis to inform the user about HDD activity and the power on/off status of the system.

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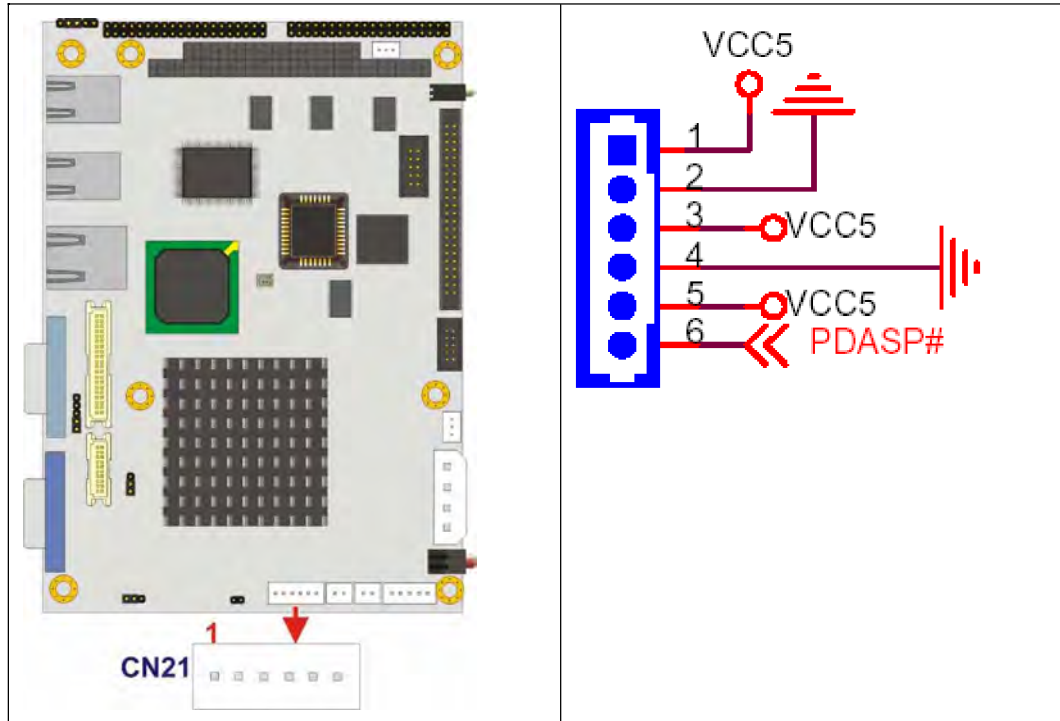


Figure 4-11: LED Connector Locations

PIN NO.	DESCRIPTION
1	+5V
2	GND
3	Power LED+
4	Power LED-
5	HDD LED+
6	HDD LED-

Table 4-11: LED Connector Pinouts

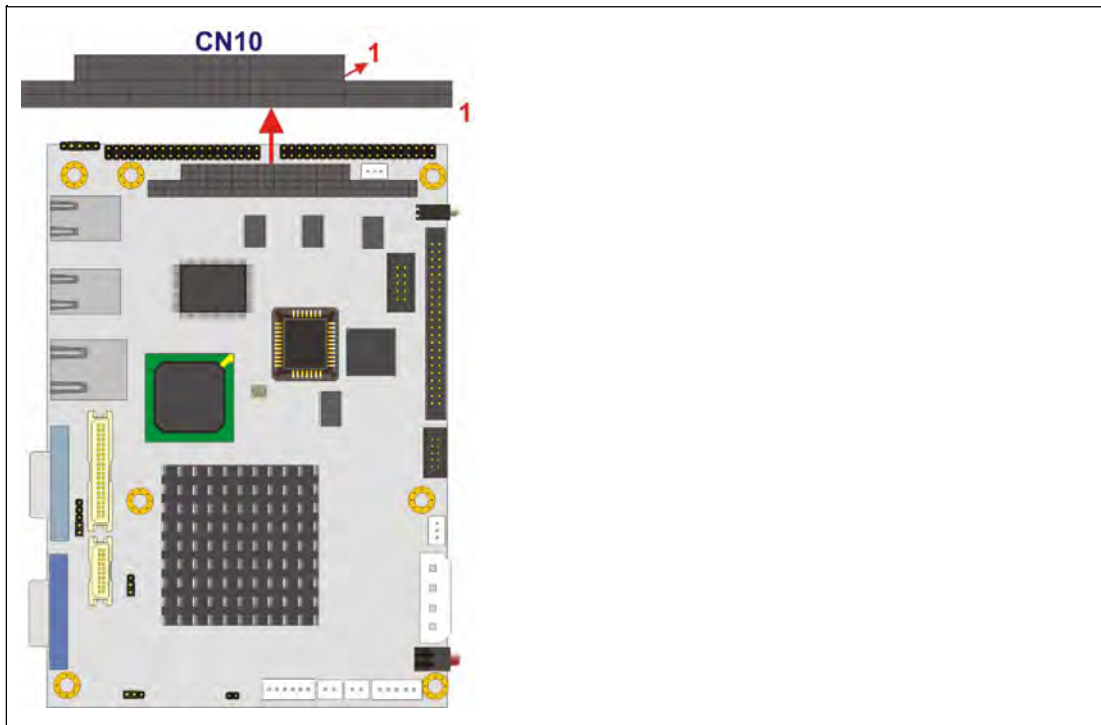
4.2.10 PC/104 Slot

CN Label: CN10
CN Type: 104-pin PC/104 slot
CN Location: See Figure 4-12

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CN Pinouts: See Table 4-12

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



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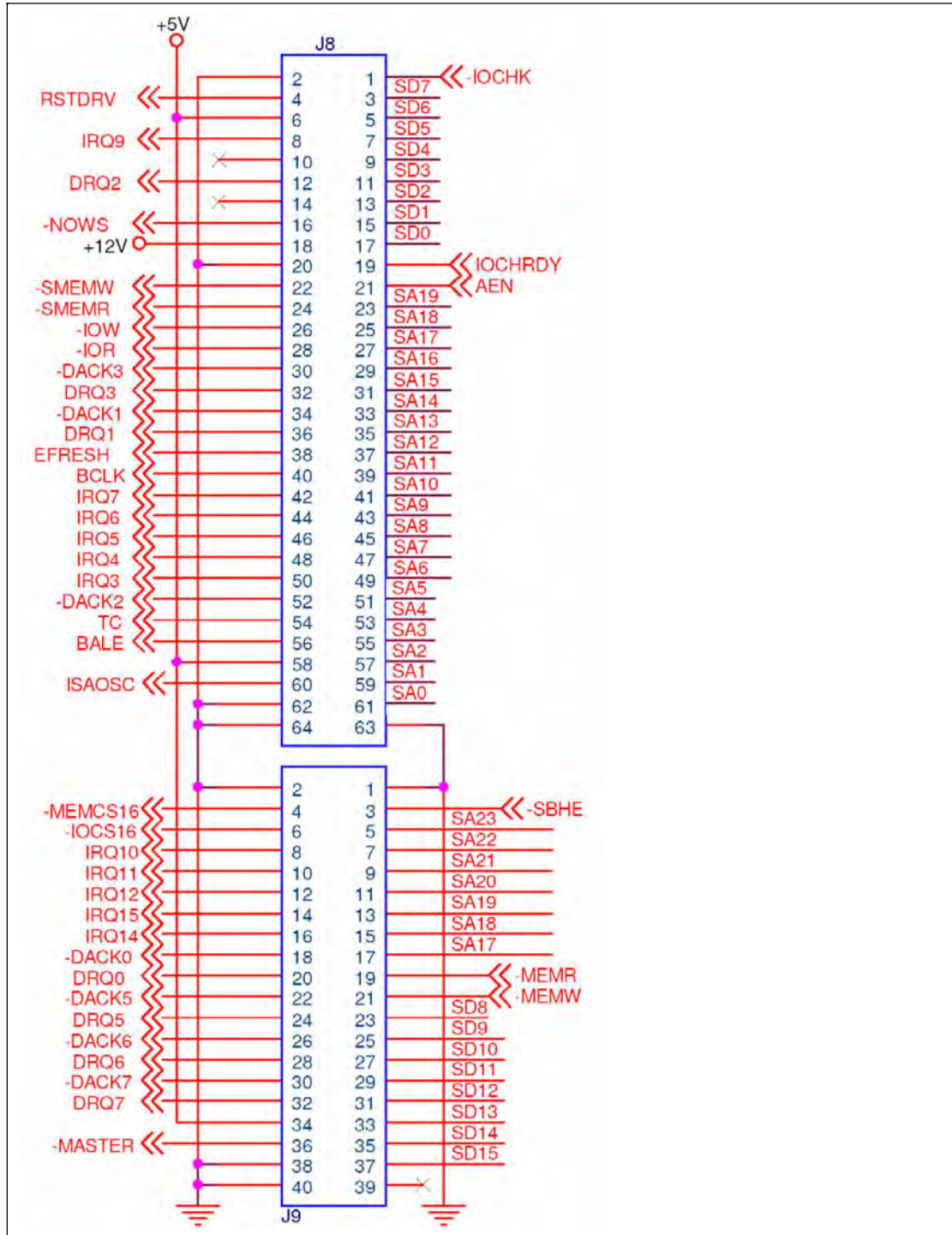


Figure 4-12: PC/104 Slot Location

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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	ISACK	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		

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30	SA1	ISA_OSC		
31	SA0	GROUND		
32	GROUND	GROUND		

Table 4-12: PC/104 Slot Connector Pinouts

4.2.11 PC/104 Power Input Connector

- CN Label:** CN12
- CN Type:** 3-pin wafer (1x3)
- CN Location:** See Figure 4-13
- CN Pinouts:** See Table 4-13

The PC/104 power input connector provides power to the PC/104 expansion module installed on the PC/104 slot.

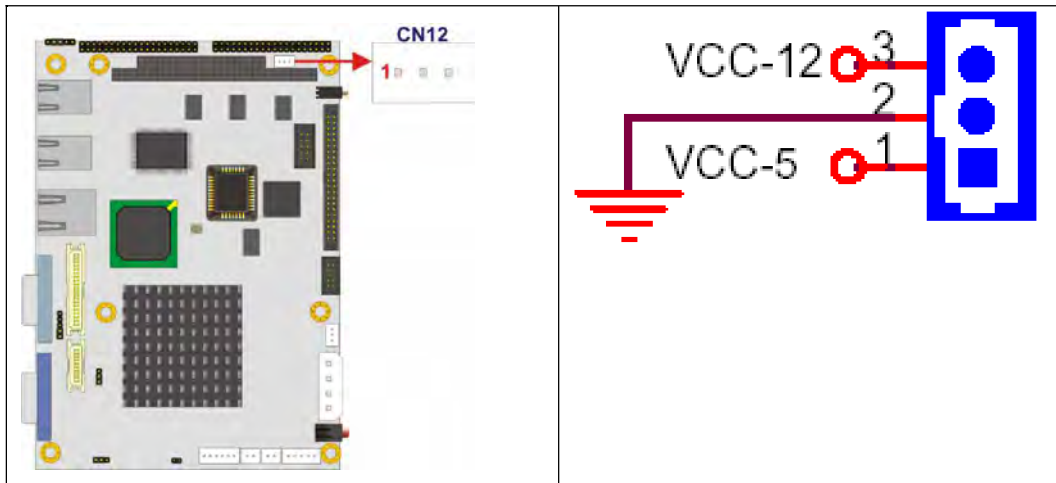


Figure 4-13: PC/104 Power Input Connector Pinouts

PIN NO.	DESCRIPTION
1	-5V
2	GND
3	-12V

Table 4-13: PC/104 Power Input Connector Pinouts

4.2.12 Power Button Connector

- CN Label:** CN19
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See Figure 4-14
- CN Pinouts:** See Table 4-14

The power button connector is connected to a power switch on the system chassis to enable users to turn the system on and off.

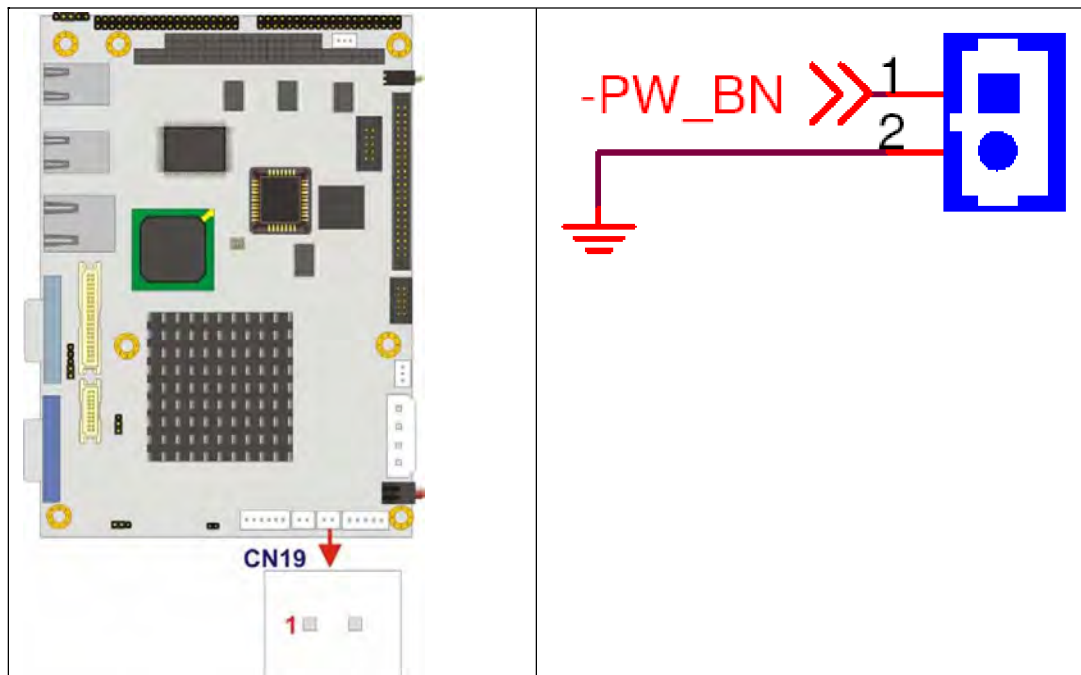


Figure 4-14: Power Button Connector Location

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PIN NO.	DESCRIPTION
1	Power Switch
2	GND

Table 4-14: Power Button Connector Pinouts

4.2.13 Reset Button Connector

CN Label:	CN20
CN Type:	2-pin wafer (1x2)
CN Location:	See Figure 4-15
CN Pinouts:	See Table 4-15

The reset button connector is connected to a reset switch on the system chassis to enable users to reboot the system when the system is turned on.

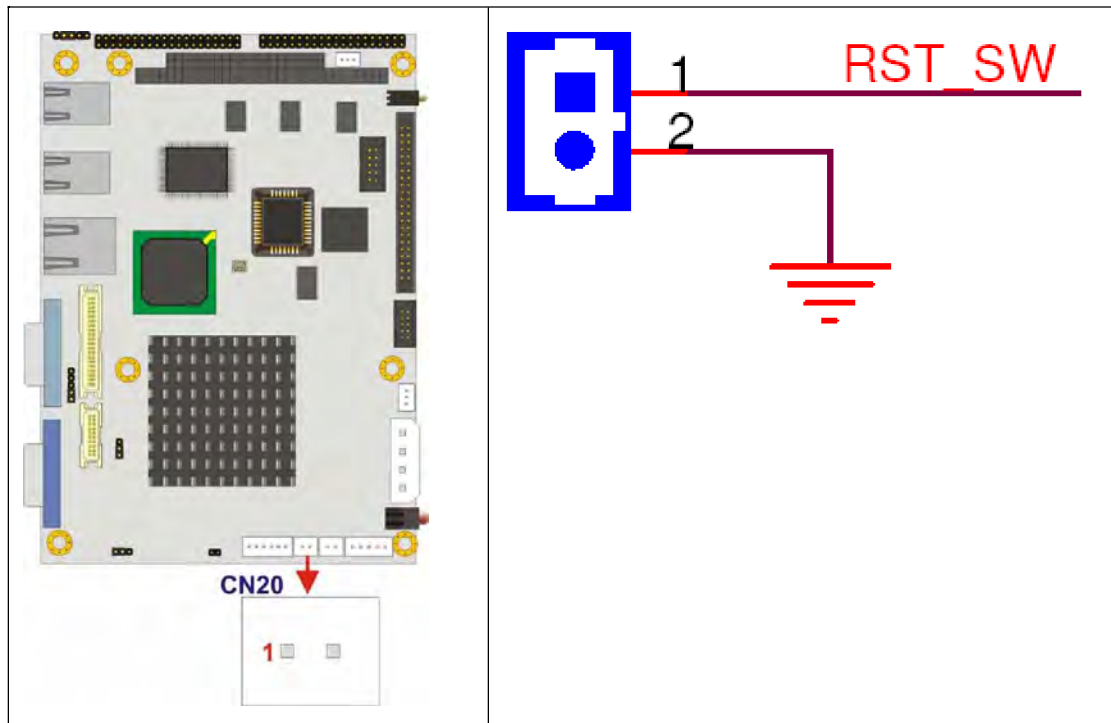


Figure 4-15: Reset Button Connector Locations

PIN NO.	DESCRIPTION
1	Reset Switch
2	GND

Table 4-15: Reset Button Connector Pinouts

4.2.14 Serial Port Connector (COM 2, COM 3 and COM 4)

- CN Label:** CN9
- CN Type:** 40-pin header (2x20)
- CN Location:** See **Figure 4-16**
- CN Pinouts:** See **Table 4-16**

The 40-pin serial port connector contains the following three serial ports, COM 2, COM 3 and COM 4. COM 3 and COM 4 are RS-232 serial communications channels. COM 2 is a multi function channel. In default mode COM 2 is an RS-232 serial communication channel but, with the COM 2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel. The serial port locations are specified below.

- „ COM 2 is located on pin 1 to pin 20
- „ COM 3 is located on pin 21 to pin 30
- „ COM 4 is located on pin 31 to pin 40

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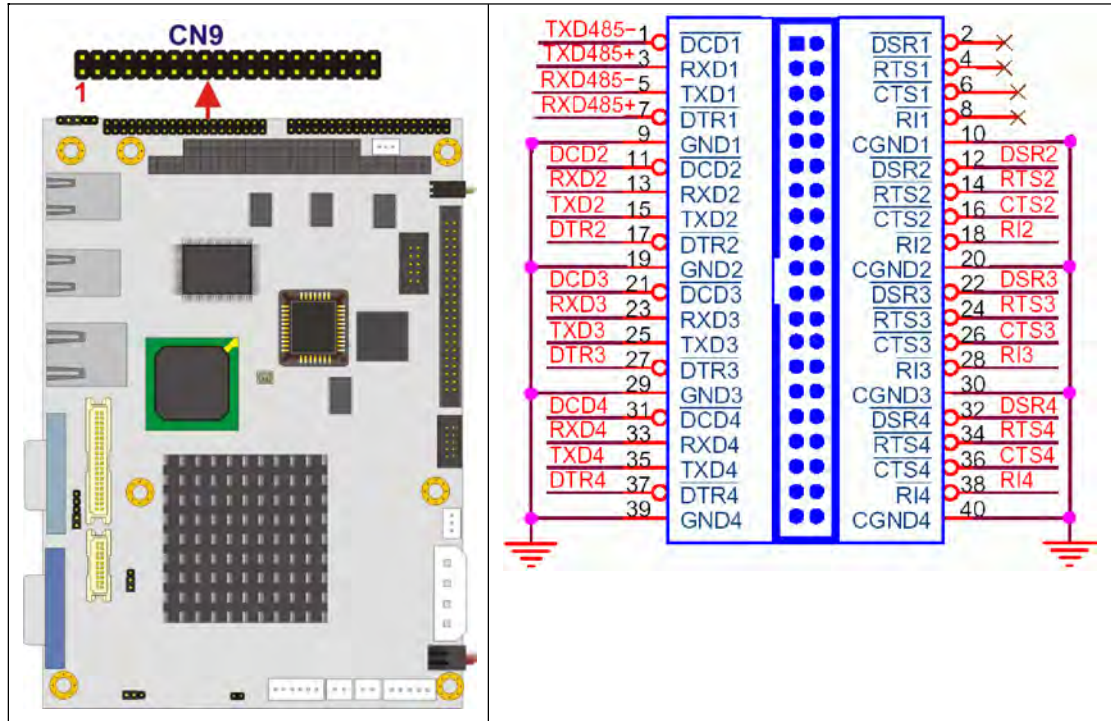


Figure 4-16: COM 2 to COM 4 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TXD485-	2	N/C
3	TXD485+	4	N/C
5	RXD485+	6	N/C
7	RXD485-	8	N/C
9	GND	10	GND
11	DCD2	12	DSR2
13	RXD2	14	RTS2
15	TXD2	16	CTS2
17	DTR2	18	RI 2
19	GND	20	GND
21	DCD3	22	DSR3
23	RXD3	24	RTS3
25	TXD3	26	CTS3
27	DTR3	28	RI 3
29	GND	30	GND

31	DCD4	32	DSR4
33	RXD4	34	RTS4
35	TXD4	36	CTS4
37	DTR4	38	RI 4
39	GND	40	GND

Table 4-16: COM 2 to COM 4 Connector Pinouts

4.2.15 Serial Port Connector (COM 5, COM 6, COM 7 and COM 8)

- CN Label:** CN11
- CN Type:** 40-pin header (2x20)
- CN Location:** See **Figure 4-16**
- CN Pinouts:** See **Table 4-16**

The 40-pin serial port connector contains the following four serial ports, COM 5, COM 6, COM 7 and COM 8. All four serial ports are RS-232 serial communications channels. The serial port locations are specified below.

- „ COM 5 is located on pin 1 to pin 10
- „ COM 6 is located on pin 11 to pin 20
- „ COM 7 is located on pin 21 to pin 30
- „ COM 8 is located on pin 31 to pin 40

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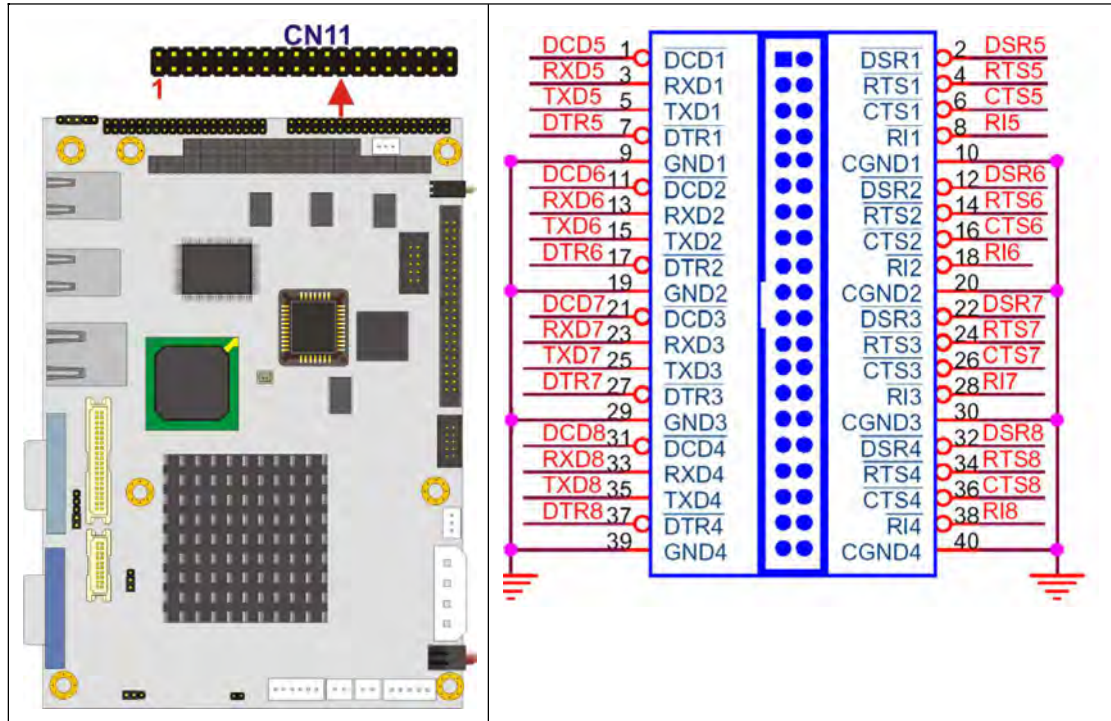


Figure 4-17: COM 5 to COM 8 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD5	2	DSR5
3	RXD5	4	RTS5
5	TXD5	6	CTS5
7	DTR5	8	RI 5
9	GND	10	GND
11	DCD6	12	DSR6
13	RXD6	14	RTS6
15	TXD6	16	CTS6
17	DTR6	18	RI 6
19	GND	20	GND
21	DCD7	22	DSR7
23	RXD7	24	RTS7
25	TXD7	26	CTS7
27	DTR7	28	RI 7
29	GND	30	GND

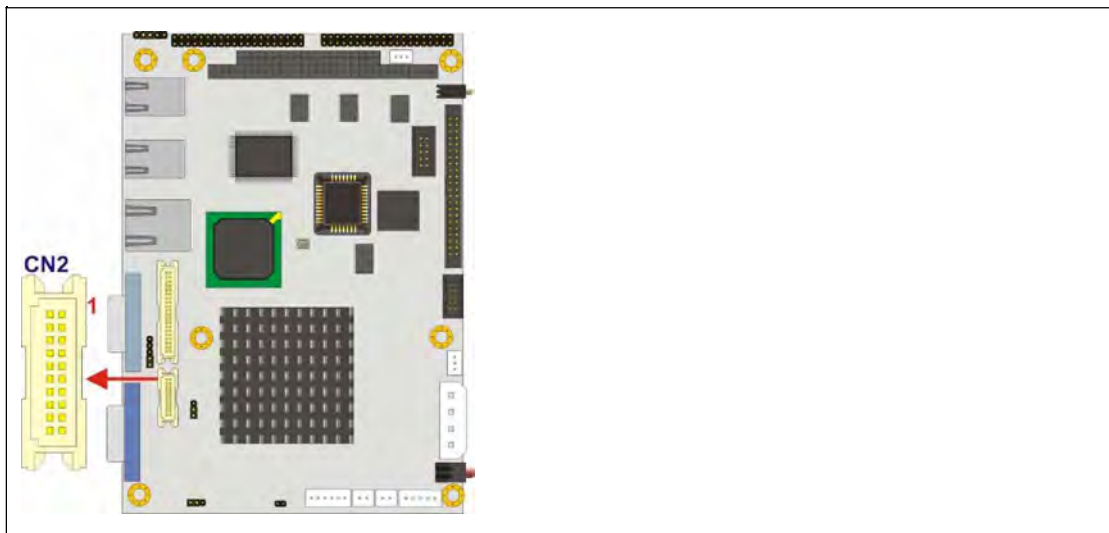
31	DCD8	32	DSR8
33	RXD8	34	RTS8
35	TXD8	36	CTS8
37	DTR8	38	RI 8
39	GND	40	GND

Table 4-17: COM 5 to COM 8 Connector Pinouts

4.2.16 TFT LCD LVDS Connector

- CN Label:** CN2
- CN Type:** 20-pin crimp (2x10)
- CN Location:** See Figure 4-18
- CN Pinouts:** See Table 4-18

The 20-pin TFT LCD LVDS can be connected to a TFT LCD screen directly.



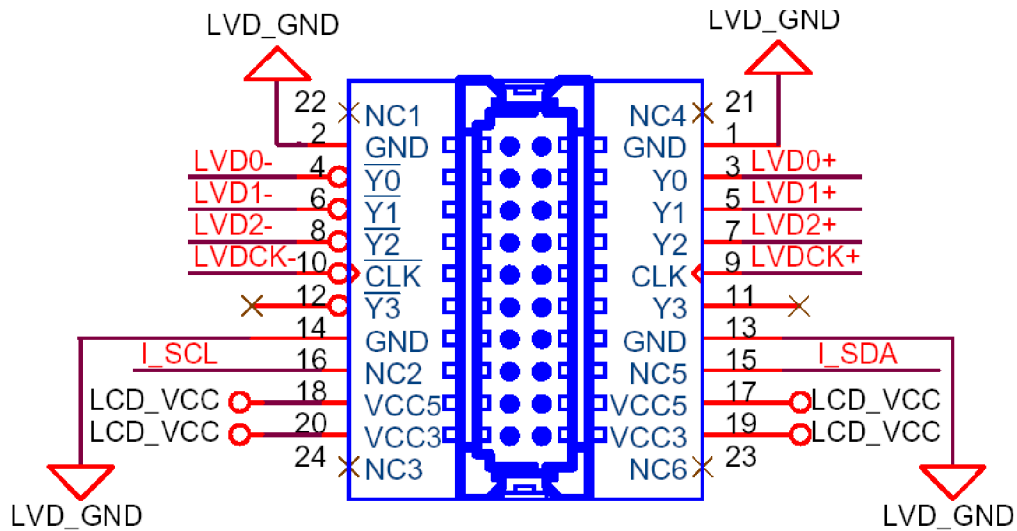


Figure 4-18: TFT LCD LVDS Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	DO+	4	DO-
5	D1+	6	D1-
7	D2+	8	D2-
9	CLK+	10	CLK-
11	NC	12	NC
13	GND	14	GND
15	SDATA	16	SCLK
17	LCD_Vcc	18	LCD_Vcc
19	LCD_Vcc	20	LCD_Vcc

Table 4-18: TFT LCD LVDS Port Connector Pinouts

4.2.17 TFT LCD TTL Connector

- CN Label:** CN4
- CN Type:** 40-pin crimp (2x20)
- CN Location:** See Figure 4-19

CN Pinouts: See Table 4-19

The TFT LCD LVDS can be connected to a TFT LCD screen directly.

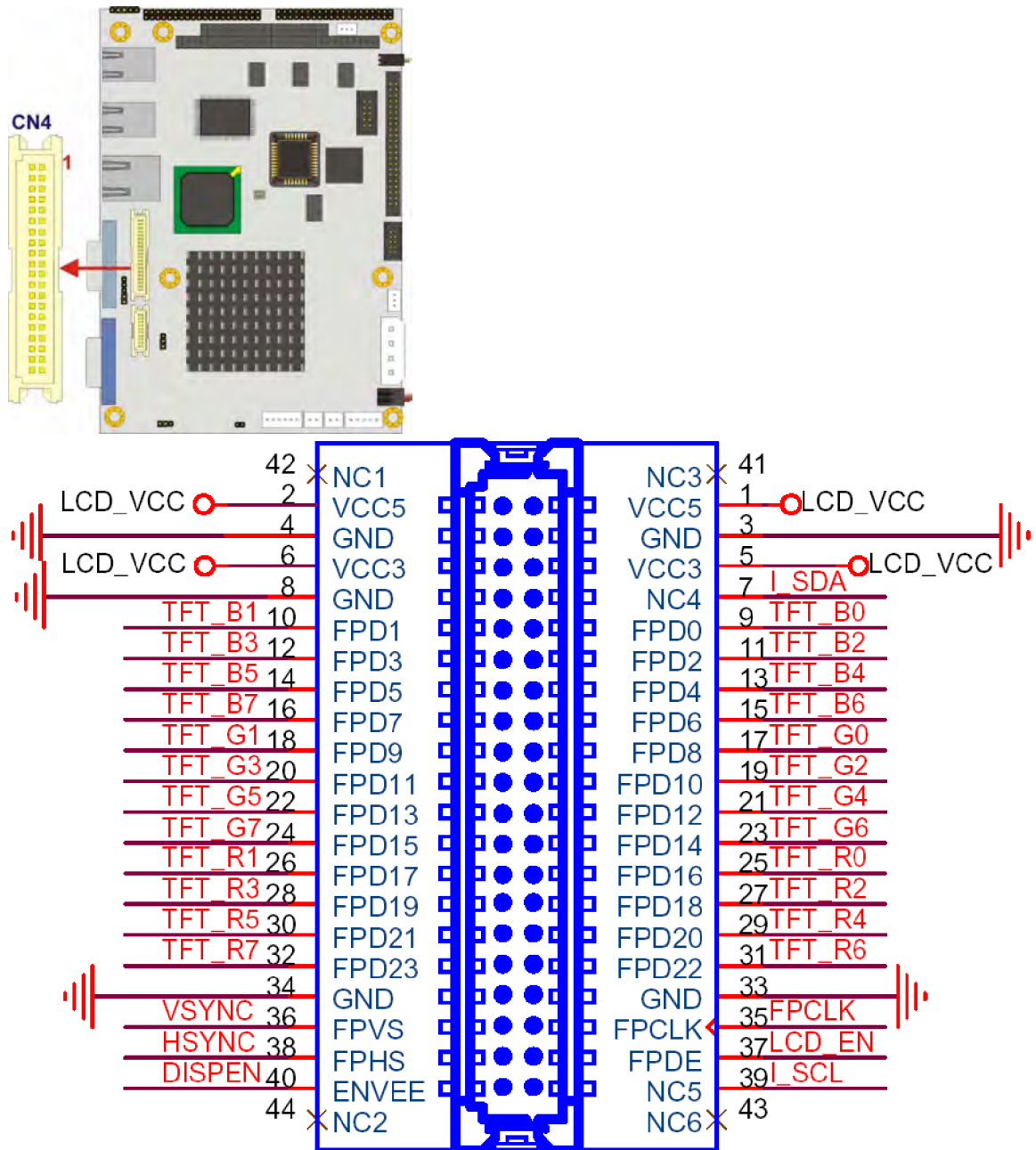


Figure 4-19: TFT LCD TTL Connector Pinout Locations

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PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCD_Vcc	2	LCD_Vcc
3	GND	4	GND
5	LCD_Vcc	6	LCD_Vcc
7	SDA	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
26	R2	28	R3
29	R4	30	R5
31	R6	32	R7
33	GND	34	GND
35	CLK	36	VSYNC
37	LCD_EN	38	HSYNC
39	SCL	40	DISP_EN

Table 4-19: TFT LCD TTL Port Connector Pinouts

4.3 External Peripheral Interface Connectors

4.3.1 External Peripheral Interface Connector Overview

The 3301825 external peripheral interface connectors are listed below and shown in Figure 4-20:

- „ 1 x RJ-45 Ethernet connector
- „ 1 x Serial communications port
- „ 2 x USB combo port
- „ 1 x VGA port

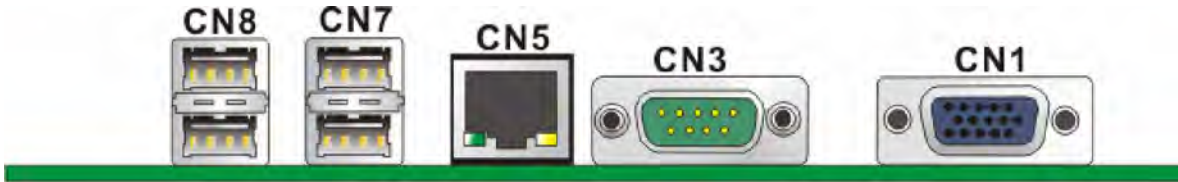


Figure 4-20: 3301825 On-board External Interface Connectors

4.3.2 RJ-45 Ethernet Connector

- CN Label:** CN5
- CN Type:** RJ-45
- CN Location:** See Figure 4-20
- CN Pinouts:** See Table 4-20

The RJ-45 Ethernet connector on the 3301825 provides connectivity to a 10/100 megabit Ethernet connection between the 3301825 and a Local Area Network (LAN) through a network hub.

PIN NO.	DESCRIPTION
1	TX+
2	N/C
3	TX-
4	RX+
5	N/C
6	RX-
7	N/C
8	N/C

Table 4-20: RJ-45 Ethernet Connector Pinouts

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Figure 4-21: J7 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.

SPEED LED		LINK LED	
Status	Description	Status	Description
GREEN	ON: 100MB OFF: 10MB	YELLOW	ON: Linked Flashing: Activity

Table 4-21: J7 Connector LEDs

4.3.3 Serial Port Connector (COM 1)

- CN Label:** CN3
- CN Type:** DB-9 connector
- CN Location:** See **Figure 4-20**
- CN Pinouts:** See **Table 4-22** and **Figure 4-22**

The 9-pin DB-9 COM 1 serial port connector is connected to RS-232 serial communications devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD1	2	RXD1
3	TXD1	4	DTR1
5	GND	6	DSR1
7	RTS1	8	CTS1
9	COM_R1 1		

Table 4-22: RS-232 Serial Port (COM 1) Pinouts

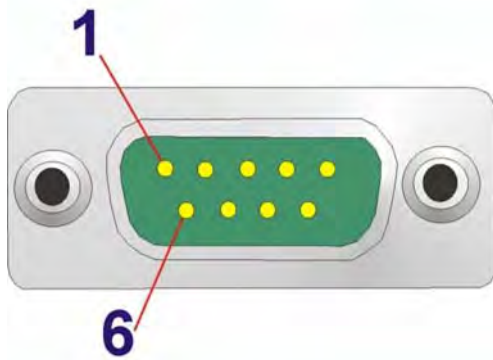


Figure 4-22: COM1 Pinout Locations

4.3.4 USB Combo Port

- CN Label:** CN7 and CN8
- CN Type:** USB Combo port
- CN Location:** See Figure 4-20
- CN Pinouts:** See Table 4-23

The two USB combo ports provide connectivity to USB devices. The USB port support both USB 1.1 and USB 2.0.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC_USB	2	DATA1-
3	DATA1 +	4	GND
5	VCC_USB	6	DATA2-

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7	DATA2+	8	GND
---	--------	---	-----

Table 4-23: USB Connector Pinouts

4.3.5 VGA Connector

CN Label: CN1

CN Type: DB15

CN Location: See Figure 4-20

CN Pinouts: See Figure 4-23 and Table 4-24

The standard 15-pin female DB15 VGA connector connects to a CRT or LCD monitor directly.

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	6	GROUND	11	NC
2	GREEN	7	GROUND	12	DDCDAT
3	BLUE	8	GROUND	13	HSYNC
4	NC	9	NC	14	VSYNC
5	GROUND	10	GROUND	15	DDCCLK

Table 4-24: VGA Connector Pinouts

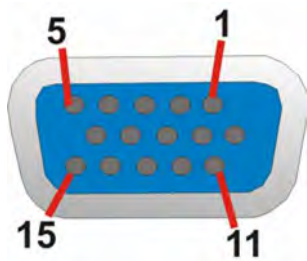


Figure 4-23: VGA Connector

Chapter

5

Installation

5.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the 3301825 may result in permanent damage to the 3301825 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3301825. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 3301825, 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 3301825, place it on an anti-static pad. This reduces the possibility of ESD damaging the 3301825.
- „ ***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 3301825 is installed. All installation notices pertaining to the installation of the 3301825 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the 3301825 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 3301825, 3301825 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 3301825 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 3301825 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 3301825 off:**

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- When working with the 3301825, 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 3301825 DO NOT:

- „ Remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- „ Use the product before verifying all the cables and power connectors are properly connected.
- „ 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 3301825 is properly installed.

- „ All the items in the packing list are present (see **Chapter 4**)
- „ A compatible memory module is properly inserted into the slot (see **Chapter 2**)
- „ The CF Type I or CF Type II card is properly installed into the CF socket
- „ The jumpers have been properly configured
- „ The 3301825 is installed into a chassis with adequate ventilation
- „ The correct power supply is being used
- „ The following devices are properly connected
 - Audio kit
 - Power supply
 - Serial port cables
- „ The following external peripheral devices are properly connected to the chassis:
 - VGA screen
 - RS-232 serial communications device
 - USB devices

5.3 SODIMM Installation and CF Card Installation

5.3.1 SODIMM Installation



WARNING:

Using an incorrectly specified SODIMM may cause permanent damage to the 3301825. Please make sure the purchased SODIMM complies with the memory specifications of the 3301825. SODIMM specifications compliant with the 3301825 are listed in Chapter 2.

To install a SODIMM into a SODIMM socket, please follow the steps below and refer Figure 5-1.

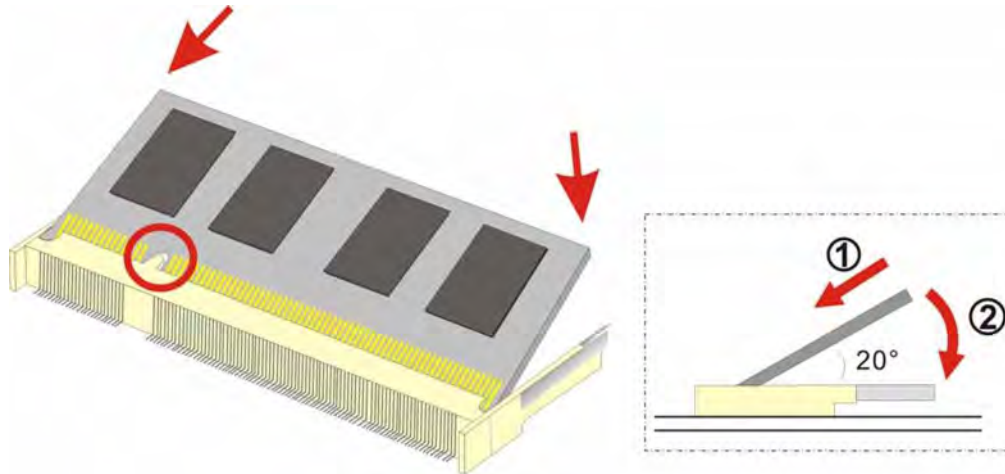


Figure 5-1: SODIMM Installation

- Step 1:** **Locate the SODIMM socket.** Place the 3301825 on an anti-static pad with the solder side facing up.
- Step 2:** **Align the SODIMM with the socket.** The SODIMM must be oriented in such a way that the notch in the middle of the SODIMM must be aligned with the plastic bridge in the socket.

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- Step 3: Insert the SODIMM.** Push the SODIMM chip into the socket at an angle. (See **Figure 5-1**)
- Step 4: Open the SODIMM socket arms.** Gently pull the arms of the SODIMM socket out and push the rear of the SODIMM down. (See **Figure 5-1**)
- Step 5: Secure the SODIMM.** Release the arms on the SODIMM socket. They clip into place and secure the SODIMM in the socket.

5.3.2 CF Card Installation



Note:

The 3301825 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 3301825, please follow the steps below:

- Step 1: Locate the CF card socket.** Place the 3301825 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 5-2**.

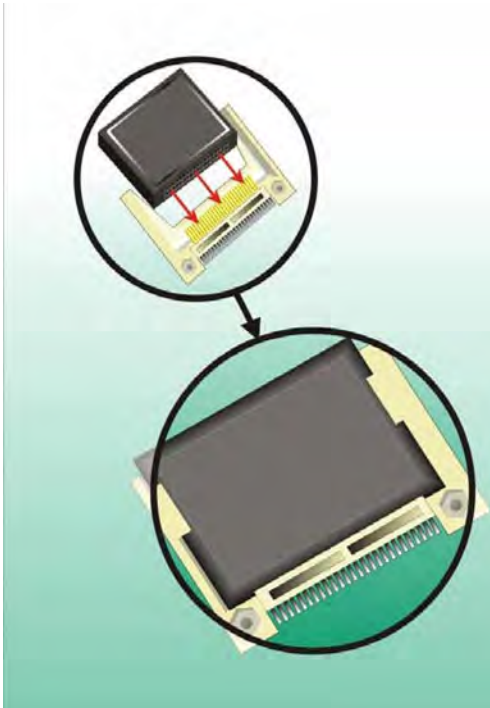


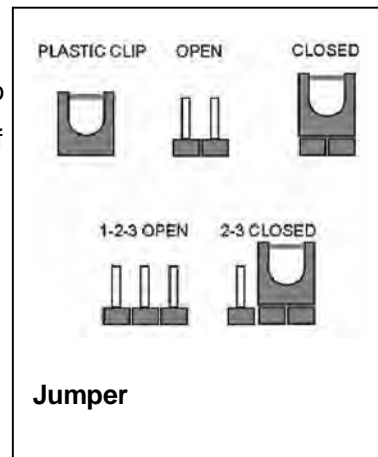
Figure 5-2: CF Card Installation

5.4 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.



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Before the 3301825 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the 3301825 are listed in Table 5-1.

Description	Label	Type
AT power select	JP4	2-pin header
COM 1 Pin 9 setting	JP1	5-pin header
COM 2 function select	JP3	5-pin header
LCD voltage select	JP2	3-pin header
LCD clock select	JP5	3-pin header

Table 5-1: Jumpers

5.4.1 AT Power Select Jumper Settings

Jumper Label:	JP4
Jumper Type:	2-pin header
Jumper Settings:	See Table 5-2
Jumper Location:	See Figure 5-3

The AT Power Select jumper specifies the systems power mode as AT or ATX. AT Power Select jumper settings are shown in **Table 5-2**. If the AT power is used and the system is connected to an ATX power supply, the system will automatically turn on.

AT Power Select	Description	
Short	Use AT power	Default
Open	Use ATX power	

Table 5-2: AT Power Select Jumper Settings

The location of the AT Power Select jumper is shown in **Figure 5-3** below.

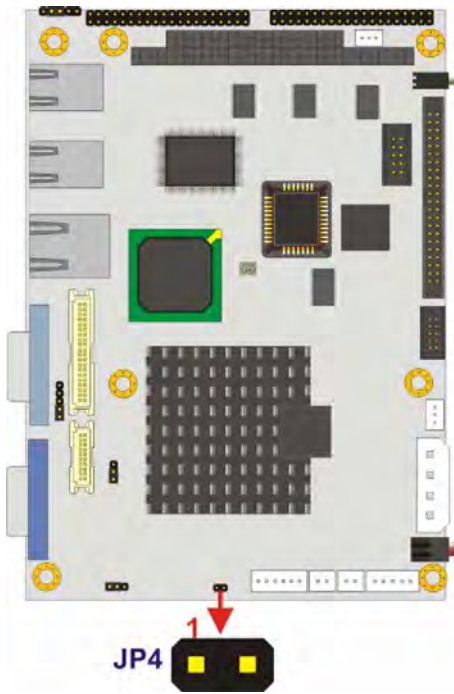


Figure 5-3: AT Power Select Jumper Location

5.4.2 Clear CMOS Jumper

Jumper Label:	CN22
Jumper Type:	2-pin header
Jumper Settings:	See Table 5-3
Jumper Location:	See Figure 5-4

If the 3301825 fails to boot due to improper BIOS settings, the CMOS can be cleared using the battery connector. Disconnect the battery from the connector for a few seconds then reconnect the battery. The CMOS should be cleared.

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

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- „ 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	
Short	Keep CMOS Setup	Default
Open	Clear CMOS Setup	

Table 5-3: CN22 Clear CMOS Jumper Settings

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

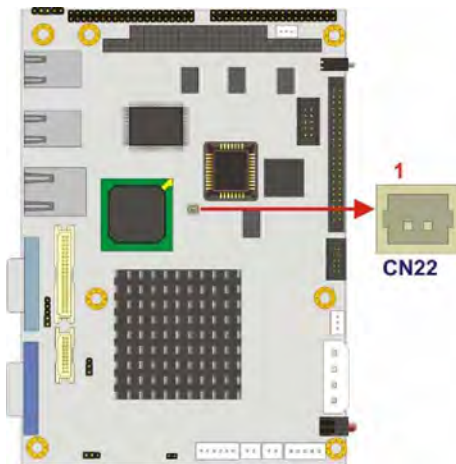


Figure 5-4: CN22 Clear CMOS Jumper

5.4.3 COM 1 Pin 9 Setting Jumper

Jumper Label:	JP1
Jumper Type:	5-pin header
Jumper Settings:	See Table 5-4
Jumper Location:	See Figure 5-5

The COM 1 Pin 9 Setting jumper configures pin 9 on COM 1 as either a +5V, +12V power source or as a ring-in (RI) line. The COM 1 Pin 9 Setting jumper selection options are shown in **Table 5-4**.

COM 1 RI Pin	Description	
Short 1 – 2	COM 1 RI Pin use RI	Default
Short 2 – 3	COM 1 RI Pin use +5V	
Short 3 – 4	COM 1 RI Pin use +5V	
Short 4 – 5	COM 2 RI Pin use +12V	

Table 5-4: COM 1 Pin 9 Setting Jumper Settings

The COM 1 Pin 9 Setting jumper location is shown in **Figure 5-5** below.

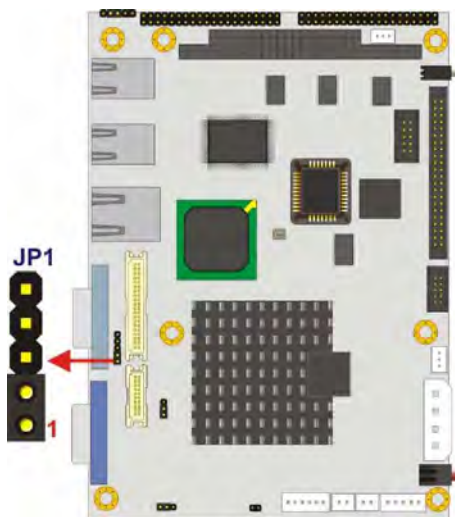


Figure 5-5: COM 1 Pin 9 Setting Jumper Location

5.4.4 COM 2 Function Select Jumper

Jumper Label:	JP3
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-7
Jumper Location:	See Figure 5-8

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The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 5-7**.

COM 2 Function Select	Description	
Short 1-2	RS-232	Default
Short 2-3	RS-422	
Short 3-4	RS-422	
Short 4-5	RS-485	

Table 5-5: COM 2 Function Select Jumper Settings

The COM 2 Function Select jumper location is shown in **Figure 5-8**.

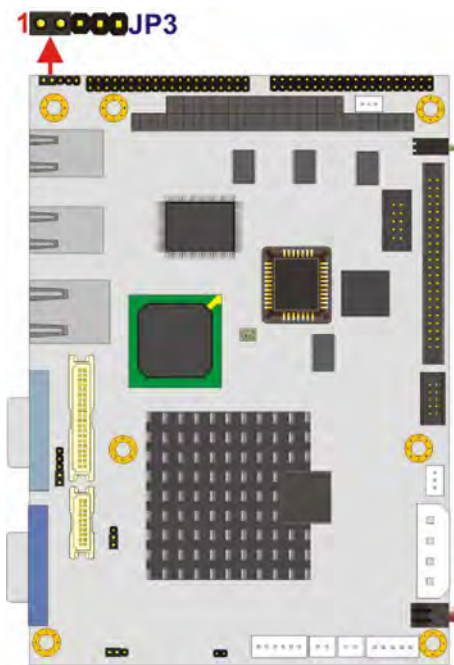


Figure 5-6: COM 2 Function Select Jumper Location

5.4.5 LCD Voltage Selection



WARNING:

Permanent damage to the screen and 3301825 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:** JP2
- Jumper Type:** 3-pin header
- Jumper Settings:** See **Table 5-6**
- Jumper Location:** See **Figure 5-7**

The LCD Voltage Selection jumper allows the LCD screen voltage to be set. The LCD Voltage Selection jumper settings are shown in Table 5-6.

AT Power Select	Description	
Short 1-2	+3.3V LVDS	Default
Short 2-3	+5V LVDS	

Table 5-6: LCD Voltage Selection Jumper Settings

The LCD Voltage Selection jumper location. is shown in **Figure 5-7**.

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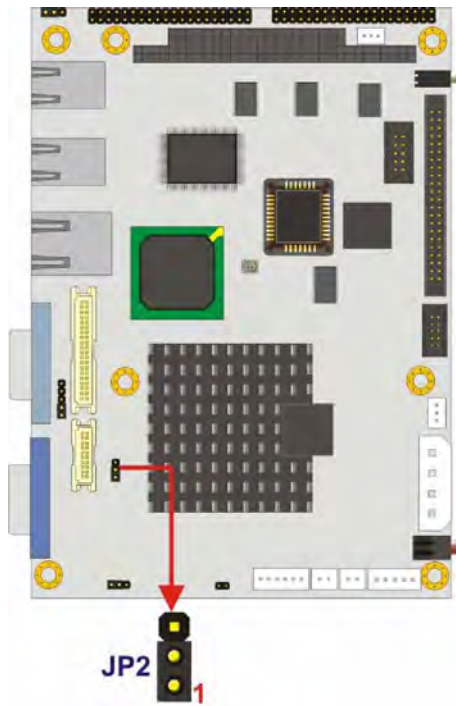


Figure 5-7: LCD Voltage Selection Jumper Location

5.4.6 LCD Clock Select Jumper

Jumper Label:	JP5
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-7
Jumper Location:	See Figure 5-8

The LCD Clock Select jumper enables the LCD clock to be inverted. The LCD Clock Select settings are shown in **Table 5-7**.

LCD Clock Select	Description	
Short 1-2	Normal LCD Clock	Default
Short 2-3	Inverted LCD Clock	

Table 5-7: LCD Clock Select Jumper Settings

The LCD Clock Select jumper location is shown in Figure 5-8.

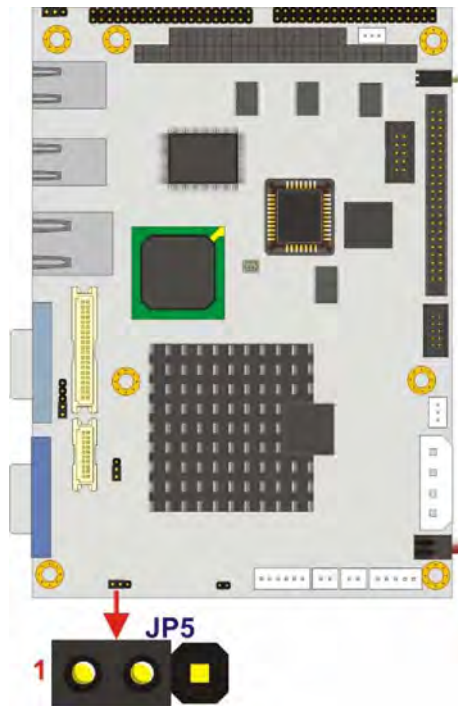


Figure 5-8: LCD Clock Select Jumper Select Jumper Location

5.5 Chassis Installation

5.5.1 Airflow



WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the 3301825 must have air vents to allow cool air to move into the system and hot air to move out.

The 3301825 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 generate airflow through the board surface.

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5.5.2 Motherboard Installation

To install the 3301825 motherboard into the chassis please refer to the reference material that came with the chassis.

5.6 Internal Peripheral Device Connections

5.6.1 Peripheral Device Cables

The cables listed in Table 5-8 are shipped with the 3301825.

Quantity	Type
1	ATA 66/100 flat cable
1	Audio cable
2	Four COM port cable

Table 5-8: Provided Cables

5.6.2 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to the 3301825 to one or two IDE devices. To connect an IDE HDD to the 3301825 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 5-9**. A key on the front of the cable connector ensures it can only be inserted in one direction.

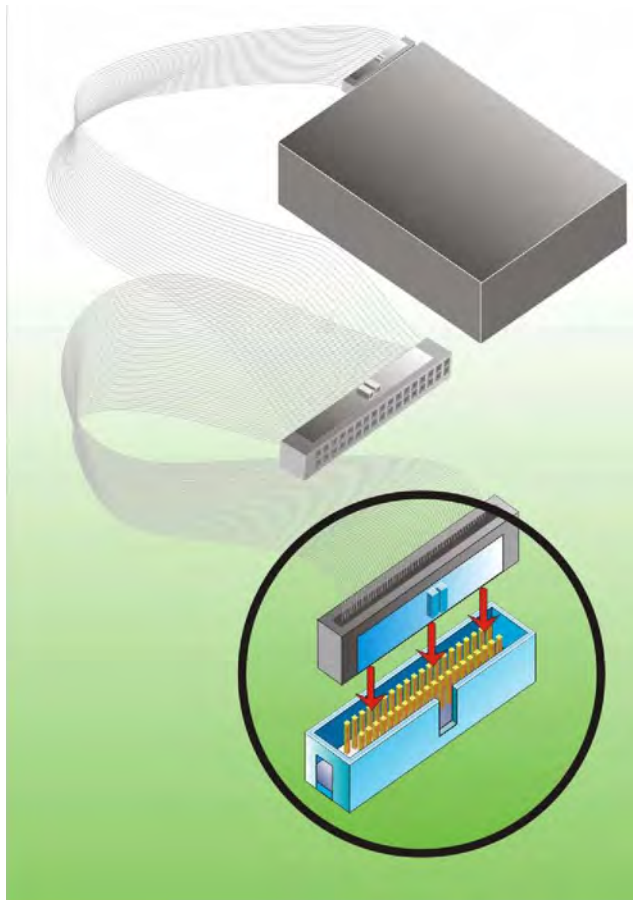


Figure 5-9: IDE Cable Connection

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

5.6.3 Audio Kit Installation

The Audio Kit that came with the 3301825 connects to the 10-pin audio connector on the 3301825. 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: **Locate the audio connector.** The location of the 10-pin audio connector is shown in **Chapter 3**.

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Step 2: **Align pin 1.** Align pin 1 on the onboard connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 5-10**.

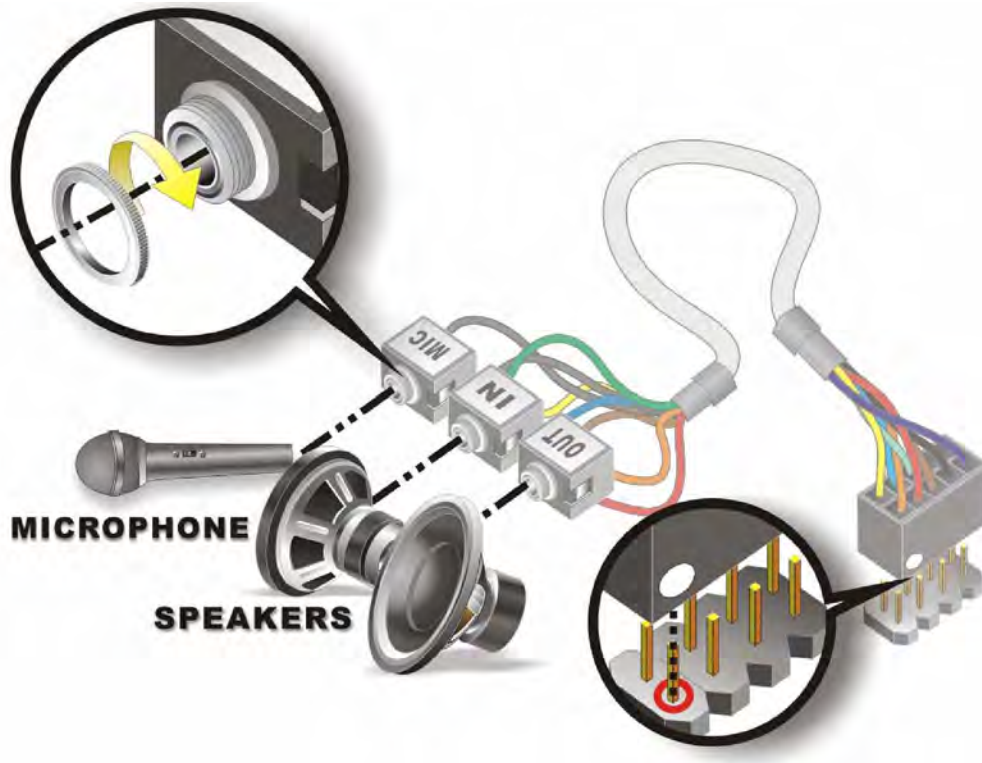


Figure 5-10: IDE Cable Connection

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

5.6.4 Four Serial Port Connector Cable

The 3301825 is shipped with two four serial port connector cables. The four serial port connector cable connects four serial port connectors on the cable to the 40 pin serial port connectors on the 3301825. To connect the four serial port connector cable please follow the steps below.

Step 1: **Locate the serial port connector.** The location of the 40-pin serial port

connector is shown in **Chapter 3**.

Step 2: Align the connectors. Correctly align pin 1 on the cable connector with pin 1 on the 3301825 keyboard/mouse connector. See **Figure 5-11**.

Step 3: Insert the cable connectors Once the cable connector is properly aligned with the keyboard/mouse connector on the 3301825, connect the cable connector to the onboard connectors. See **Figure 5-11**.

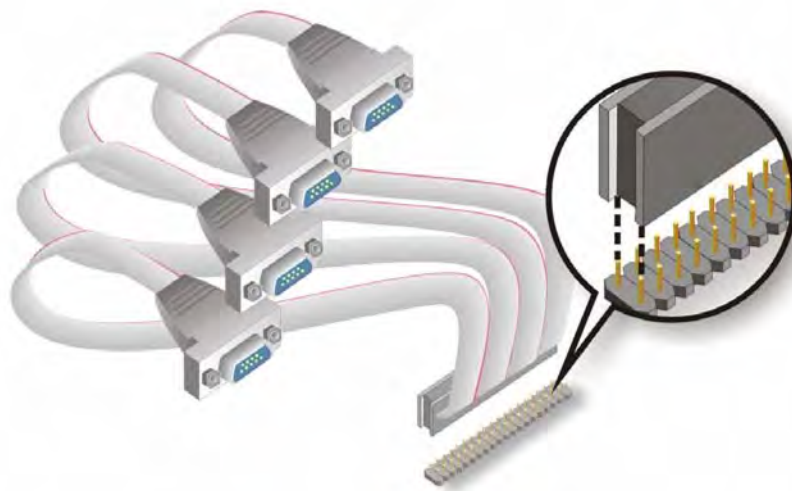


Figure 5-11: Four Serial Port Connector Cable Connection

Step 4: Attach DB-9 serial port connectors to the chassis. The four DB-9 serial port connectors can be inserted into four preformed holes in the chassis. Once, inserted the DB-9 connectors should be secured to the chassis with the retention screws.

5.7 External Peripheral Interface Connection

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

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- ” Serial port devices
- ” USB devices
- ” VGA monitors
- ” RJ-45 Ethernet cable connectors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding 3301825 external peripheral interface connector making sure the pins are properly aligned.

Appendix

A

GPIO Connection

A.1 GPIO Settings and Default Values

A.1.1 GPIO Settings

Two addresses (320h and 321h) on the LVC chipset are reserved to control the GPIO connector.

- „ Port 320h stores the data that is inputted to or outputted from the specified pin on the GPIO connector.
- „ Port 321h is the input/output setting register for each pin on the GPIO connector. If a pin outputs data, the corresponding bit is set to “0.” If a pin inputs data, the corresponding bit is set to “1.” The table below outlines the status of each GPIO pin.

Bit Number	Corresponding GPIO pin	GPIO N Status	
		Bit N = 0	Bit N = 1
Bit 0	GPIO 0	Output	Input
Bit 1	GPIO 1	Output	Input
Bit 2	GPIO 2	Output	Input
Bit 3	GPIO 3	Output	Input
Bit 4	GPIO 4	Output	Input
Bit 5	GPIO 5	Output	Input
Bit 6	GPIO 6	Output	Input
Bit 7	GPIO 7	Output	Input

A.1.2 Default Settings

The default settings for all the bits (Bit 0 to Bit 7) for both Port 320h and Port 321h are 00h.

Bit Number	Port 320h	Port 321h
Bit 0	00h	00h
Bit 1	00h	00h
Bit 2	00h	00h
Bit 3	00h	00h

Bit 4	00h	00h
Bit 5	00h	00h
Bit 6	00h	00h
Bit 7	00h	00h

A.2 Assembly Language Samples

A.2.1 GPIO Initialization Procedure

The following instruction set initializes one pin on the GPIO connector.

MOV	DX, 320h	Moves 320h into the DX data register for one of the GPIO pins
MOV	AL, XXh	Moves the user defined output value XXh into the low bit accumulator register AL
OUT	DX, AL	The content of the low bit accumulator register AL is transmitted to the address stored in the DX data register

The following instruction set initializes the input/output setting register for one pin on the GPIO connector to specify whether that pin inputs or outputs data.

MOV	DX, 321h	Moves 320h into the DX data register for one of the GPIO pins
MOV	AL, YYh	Moves the user defined output value YYh into the low bit accumulator register AL. If YY is specified as 0, the pin is an output pin. If YY is specified as 1, the pin is an input pin.
OUT	DX, AL	The content of the low bit accumulator register AL is transmitted to the address stored in the DX data register

A.2.2 General Purpose Output Procedure

The following instruction set is for a GPO procedure for one pin on the GPIO connector.

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MOV	DX, 320h	Moves 320h into the DX data register for one of the GPIO pins
MOV	AL, ZZh	Moves the user defined output data ZZh into the low bit accumulator register AL
OUT	DX, AL	The output data in the low bit accumulator register AL is transmitted out from the address stored in the DX data register

A.2.3 General Purpose Input Procedure

The following instruction set is for a GPI procedure for one pin on the GPIO connector.

MOV	DX, 320h	Moves 320h into the DX data register for one of the GPIO pins
IN	AL, DX	The input data in the low bit accumulator register AL is transmitted to the address stored in the DX data register

Appendix

B

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 C-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 ;
```

Appendix

C

Address Mapping

C.1 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	AMD Graphics Controller
3C0-3DF	AMD Graphics Controller
3F6-3F6	Primary IDE Channel
3F8-3FF	Serial Port 1 (COM1)

Table C-1: IO Address Map

C.2 1st MB Memory Address Map

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

Table C-2: 1st MB Memory Address Map

C.3 IRQ Mapping Table

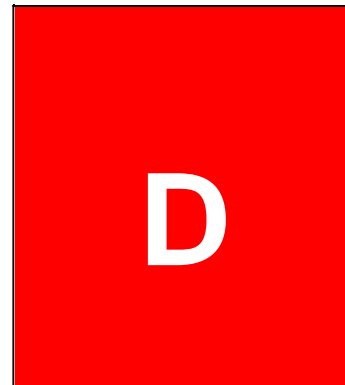
IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	LAN
IRQ3	COM2	IRQ11	LAN/USB2.0/SATA
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	SMBus Controller	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table C-3: IRQ Mapping Table

C.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table C-4: IRQ Mapping Table



External AC'97 Audio CODEC

D.1 Introduction

The motherboard comes with an on-board Realtek ALC203 CODEC. Realtek ALC203 is a 16-bit, full duplex AC'97 Rev. 2.3 compatible audio CODEC with a sampling rate of 48KHz.

D.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through a connector on the 3301825 motherboard. Connect the audio kit to the connector.

D.1.2 Driver Installation

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

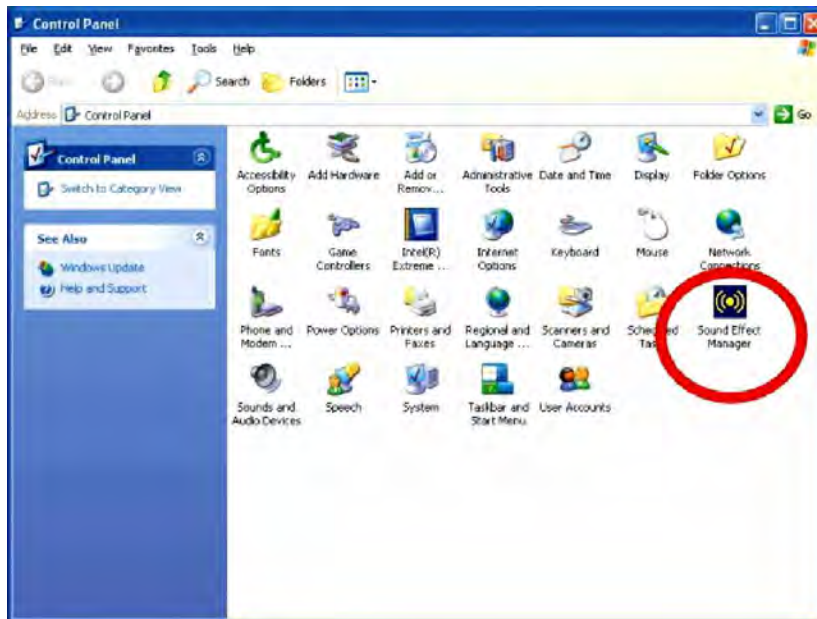


Figure D-1: Sound Effect Manager Control Panel

D.2 Sound Effect Configuration

D.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 D-2**), or
- „ The Sound Effect Manager icon in the Control Panel (**Figure D-3**).



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

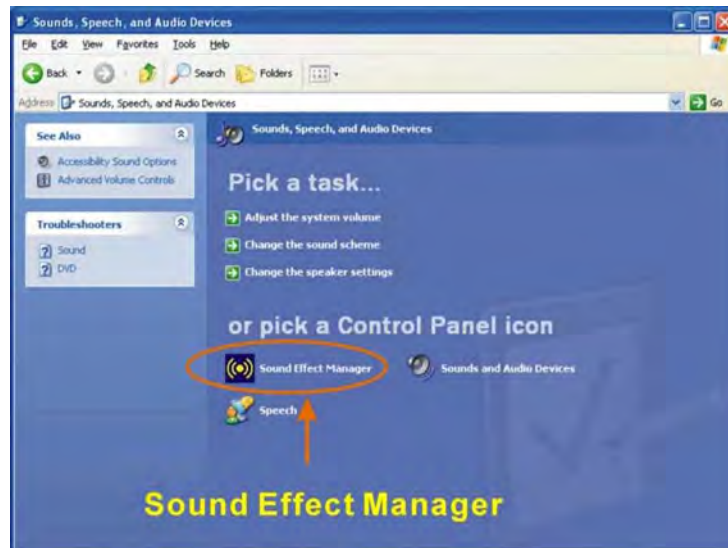


Figure D-3: Sound Effect Manager Icon [Control Panel]

Step 3: The sound effect manager appears.



NOTE:

The Sound Effect Manager shown above 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.

D.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.

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- „ **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.



Address: Global American, Inc.
17 Hampshire Drive
Hudson, NH 03051

Telephone: Toll Free U.S. Only (800) 833-8999
(603) 886-3900

FAX: (603) 886-4545

Website: <http://www.globalamericaninc.com>

Support: Technical Support at Global American
