integration with integrity

2801340 User's Manual

Mini-ITX Motherboard

Version 1.0

Copyrights

In general, the manufacturer will not be liable for any direct, indirect, special, incidental or consequential damages arising from the use of inability to use the product or documentation, even if advised of the possibility of such damages. The manufacturer keeps the rights in the subject to change the contents of this document without prior notices in order to improve the function design, performance, quality and reliability. The author assumes no responsibility for any errors or omissions, which may appear in this document, nor does it make a commitment to update the information contained herein.

Trademarks

Intel is a registered trademark of Intel Corporation.
Award is a registered trademark of Award Software, Inc.

All other trademarks, products and or product's name mentioned herein are mentioned for identification purposes only, and may be trademarks and/or registered trademarks of their respective companies or owners.

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 at (603) 886-3900, Toll Free (US only) at (800) 833-3999.

The items listed below should all be included in the 2801340 package.

- 1 x 2801340 single board computer
- 1 x IDE cable
- 1 x SATA power cable
- 2 x SATA cables
- 1 x Dual RS-232 cable
- 1 x DVI-to-VGA adapter (DVI models only)
- 1 x I/O shielding
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

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

Table of Contents

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 Introduction

The Mini-ITX 2801340 motherboard supports a 1GHz or 533MHz VIA® LUKE CPU. This Mini-ITX platform provides support for multiple display types including VGA, 24-bit or 18-bit LVDS (through a daughter board add-on) and 24-bit TTL displays. Comprehensive external I/O connectors include dual PS/2 connectors, dual audio jacks, four USB 2.0 ports dual RJ-45 connectors for dual gigabit Ethernet (GbE) connectivity, two audio jacks and an RS-232 serial port connector.

Five additional internal serial ports, including one RS-232/422/485 serial port, and four additional internal USB 2.0 ports provide further I/O connectivity to the 2801340 platform.

Diversified storage capabilities further add flexible operational capacity to the 2801340. Two IDE hard disk drives(HDD) are interfaced through a single onboard IDE connector and two serial ATA (SATA) HDD connectors connect to two 1.5Gbps SATA drives.

1.1.1 Model Variations

There are four 2801340 models. These models are listed below.

Model Name	Processor Speed	VGA or DVI Interface
2801340A	533 MHz	VGA
2801340B	1.0 GHz	VGA
2801340C	533 MHz	DVI
2801340D	1.0 GHz	DVI

Table 1-1: 2801340 Model Variations

1.1.2 2801340 Benefits

Some of the 2801340 benefits are listed below:

- Small size enables integration into applications where space is critical
- Highly scalable platform for I/O intense applications

1.1.3 2801340 Features

Some of the 2801340 features are listed below.

- Mini-ITX form factor
- 1GHz or 533 MHz VIA® LUKE CPU
- 24-bit TTL and optional 18-bit or 24-bit dual channel LVDS support
- Dual RealTek GbE chipsets
- Dual SATA support
- Eight USB 2.0 ports
- Six serial communications ports
- Two audio jacks

1.2 2801340 Overview

1.2.1 2801340 Overview Photo

The 2801340 has a wide variety of internal and external peripheral connectors. A labeled photo of the peripheral connectors on the front of the 2801340 is shown in **Figure 1-1**.

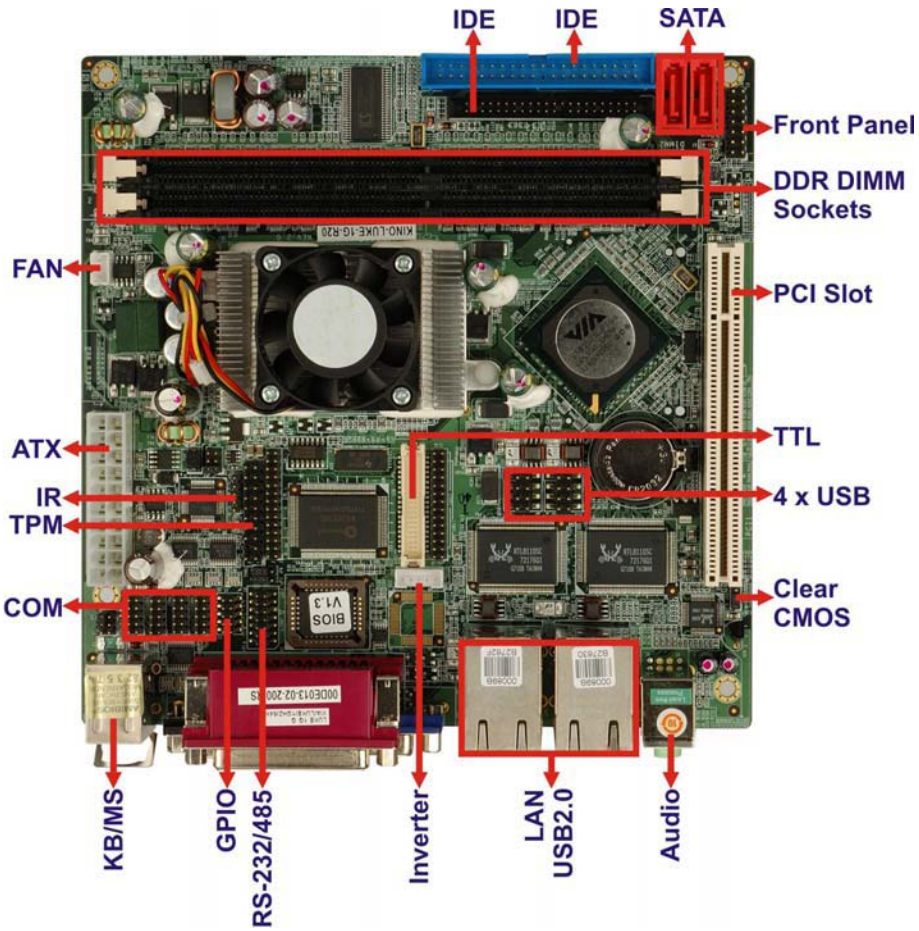

Figure 1-1: 2801340 Overview [Front View]

The external peripheral interface connectors for the DVI models are shown in **Figure 1-2**.

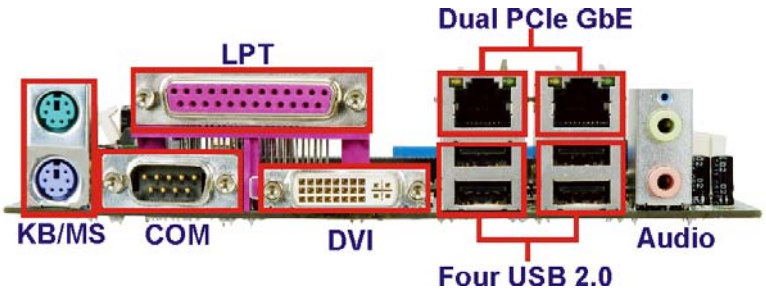

Figure 1-2: External Peripheral Interface Connectors for DVI Models

The external peripheral interface connectors for the VGA models are shown in **Figure 1-3**.

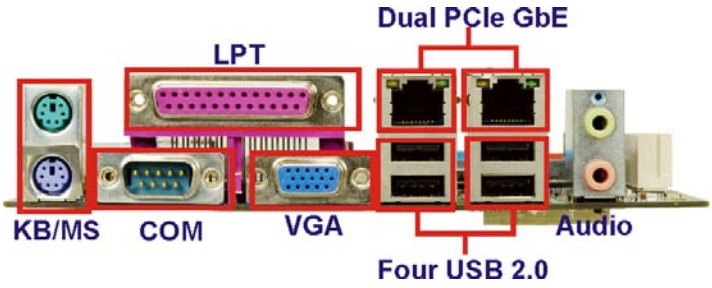

Figure 1-3: External Peripheral Interface Connectors for VGA Models

1.2.2 2801340 Peripheral Connectors and Jumpers

The 2801340 has the following connectors on-board:

- 1 x ATX power supply connector
- 1 x Fan connector
- 1 x Front panel connector
- 1 x General purpose input/output (GPIO) connector
- 2 x IDE disk drive connectors
- 1 x Infrared interface connector
- 1 x Inverter connector
- 2 x LVDS daughter board connectors
- 1 x PCI slot
- 5 x Serial port connector (four RS-232 connectors and one RS-232, RS-422 or RS-485 connector)
- 2 x Serial ATA (SATA) drive connectors
- 1x Trusted Platform Module (TPM) connector
- 1x TTL LCD connector
- 2 x USB connectors (connect to four USB devices.)

The 2801340 has the following external peripheral interface connectors on the board rear panel

- 2 x Audio jacks
- 1 x DVI connector (For DVI models only)
- 2 x Ethernet connectors
- 1 x Parallel port connector

- 1 x Serial port
- 2 x PS/2 connectors
- 4 x USB port connectors
- 1 x VGA connector (For VGA models only)

The 2801340 has the following on-board jumpers:

- Clear CMOS
- COM2 RS-232/RS-485 setup
- COM2 RS-422/RS-485 setup
- COM2 voltage selection
- LVDS voltage selection

1.2.3 Technical Specifications

2801340 technical specifications are listed in **Table 1-2**. See **Chapter 2** for details.

Specification	2801340
Form Factor	Mini-ITX
System CPU	533 MHz or 1 GHz VIA® LUKE
System Chipset	VIA® VT8237R+
Memory	Two 184-pin 1GB 400 MHz or 333 MHz DDR DIMM (Maximum supported memory of 2GB)
Display	VGA: Integrated in VIA® LUKE TTL: 24-bit TTL LVDS: 18-bit or 24-bit dual-channel with optional 3907720
BIOS	AMI Flash BIOS
Audio	RealTek ALC655 with AC'97 codec

Specification	2801340
LAN	Dual RealTek RTL 8110SC GbE chipsets
Serial Ports	Five RS-232 One RS-232/RS-422/RS-485
USB2.0	Eight USB 2.0 devices supported
IDE	One 44-pin IDE connects to two Ultra ATA33/66/100/133 devices One 40-pin IDE connects to two Ultra ATA33/66/100/133 devices
SATA	Two SATA drives supported
Keyboard/Mouse	Two PS/2 connectors connect to a keyboard and mouse
Parallel Port	One external parallel port connector
Super I/O	W83697HG
Digital I/O	8-bit digital I/O, 4-bit input and 4-bit output
Infrared	One Infrared connector
Expansion	One PCI
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Supply	AT and ATX supported
Temperature	0ºC – 60ºC (32ºF - 140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	170mm x 170mm
Weight (GW/NW)	950g/ 380g

Table 1-2: Technical Specifications

THIS PAGE IS INTENTIONALLY LEFT BLANK

Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and on-board features of the 2801340 in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are listed below:

- Length: 170 mm
- Width: 170 mm

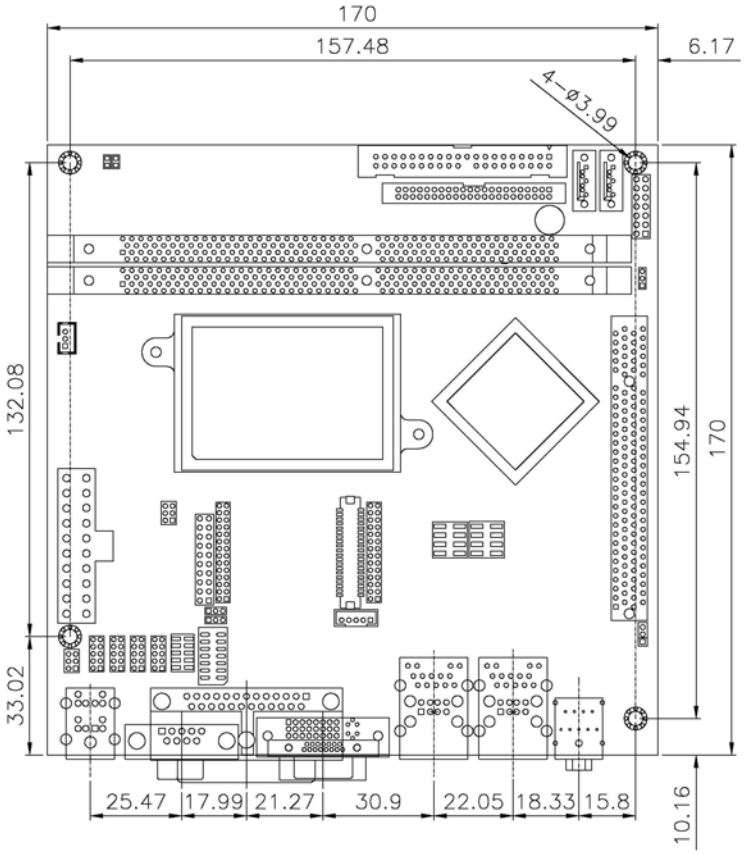

Figure 2-1: 2801340 Dimensions (mm)

2.2.2 External Interface Panel Dimensions

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

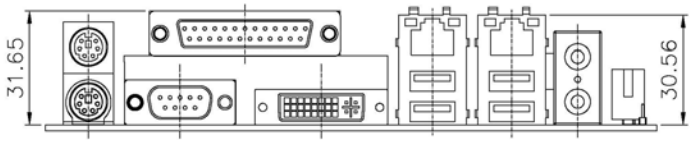

Figure 2-2: External Interface Panel Dimensions (mm)

2.3 Data Flow

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

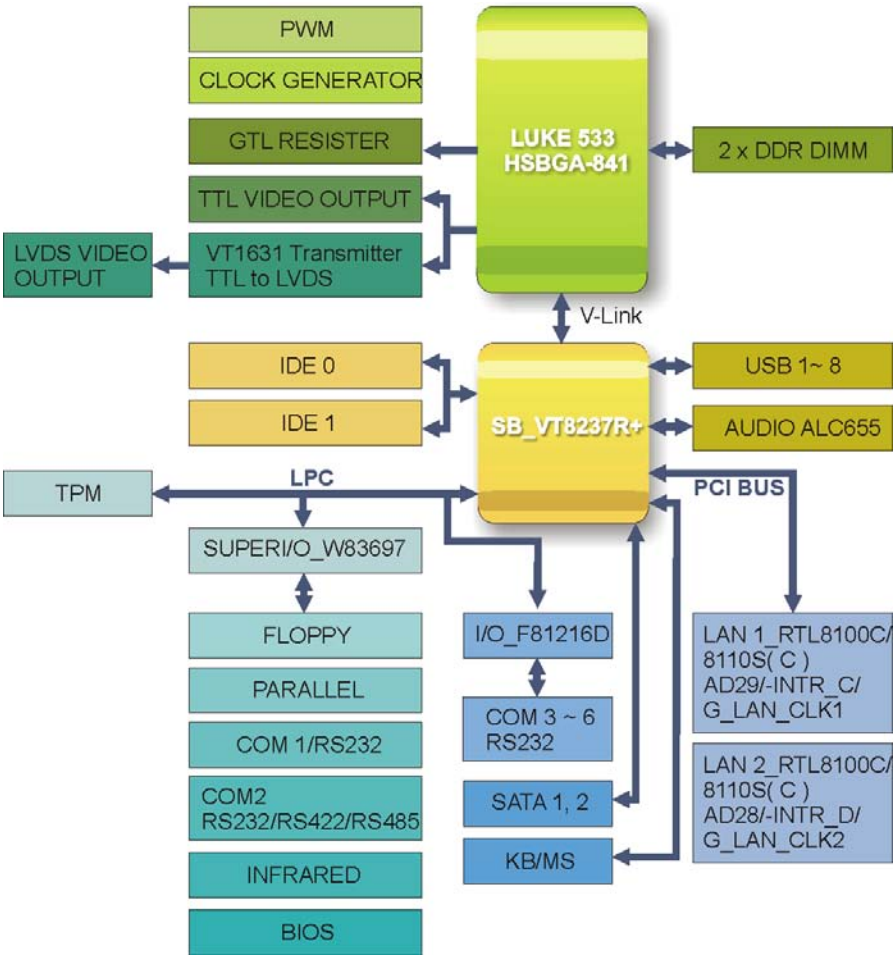

Figure 2-3: Data Flow Block Diagram

2.4 VIA® LUKE CPU Overview

The 2801340 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 into a single, low power package. The VIA® LUKE CoreFusion processor features are described below:

2.4.1 VIA® LUKE Memory Module Support

VIA® LUKE processor is interfaced to two 184-pin DDR DIMM connectors through a 64-bus. A 400MHz or 333MHz 184-pin DIMM with a maximum capacity of 1GB can be installed in each DIMM socket.

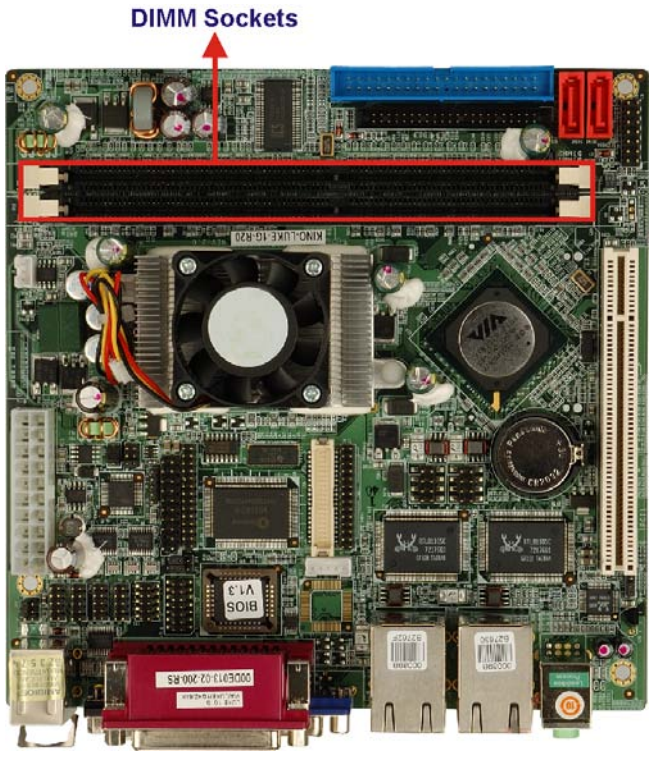

Figure 2-4: DIMM Modules

2.4.2 VIA® LUKE Display Support

VIA® LUKE processor supports the following display options:

- 24-bit TTL displays
- VGA or DVI displays
- 24-bit or 18-bit LVDS displays through an 3907720 daughter board

2.4.2.1 VGA and DVI Connectivity

As described in Chapter 1, the 2801340 EPIC can come with either a standard VGA interface connector or a DVI connector. VGA graphics are already integrated in the VIA® LUKE CPU.

The VIA® LUKE also has a VIA Graphics UniChrome™ Pro IGP graphics core. The graphics core has an integrated DVI flat panel interface and supports all HDTV formats.

2.4.2.2 TTL Display Support

24-bit TTL displays are also supported by the VIA® LUKE CPU. The TTL displays are interfaced to the CPU through a 40-pin crimp connector.

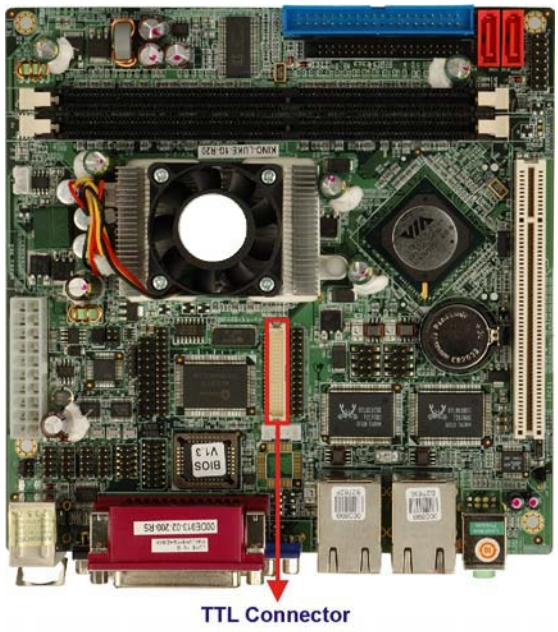

Figure 2-5: TTL Connector

2.4.2.3 LVDS Displays with Optional Daughter Board

An optional 3907720 daughter board provides connectivity to 24-bit and 18-bit LVDS displays. The 3907720 daughter board is interfaced to the VIA LUKE CPU through to board-to-board pin-header connectors. Each daughter hard has a VIA VT1631 TTL to LVDS transmitter onboard, an LVDS connector and a jumper. **Figure 2-6** shows the connectors on the front side of the 3907720 daughter board.

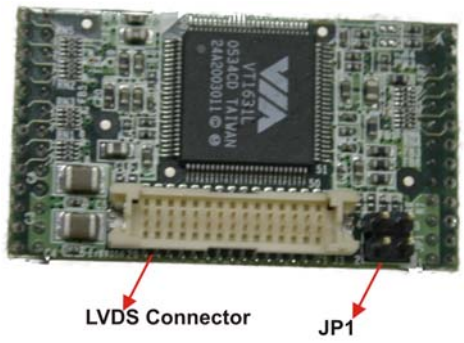

Figure 2-6: 3907720 Daughter board Overview (Front Side)

Some of the features of the VIA VT1631 are listed below:

- Complies with Open LDI Specification for Digital Display Interfaces
- 25 MHz 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)
- 2.24 to 2.75 supply voltage

2.5 VIA® VT8237R Plus Southbridge

2.5.1 VIA® VT8237R Plus Overview

The VIA® VT8237R Plus is connected to the VIA® LUKE CPU. The VIA® VT8237R Plus. Some of the features of the VIA® VT8237R Plus are listed below.

- 5.1 surround sound integrated on the chip
- AC'97 supported
- Four Parallel ATA/133 drives supported
- Two 1.5 Gbps SATA drives supported

- Eight USB 2.0 or USB 1.1 ports supported
- PCI bus controller integrated on the chip
- LPC bus controller integrated on the chip

2.5.2 VIA® VT8237R Plus Audio

The VIA® VT8237R Plus Southbridge is interfaced to a RealTek ALC655 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC. Some of the features of the RealTek ALC655 are listed below.

- Complies with PC99/2001 system performance requirements
- Complies with 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
- Sensaura™ 3DPA enhancement (optional)
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

The RealTek ALC655 is connected to two externally accessible audio jacks. The RealTek ALC655 and the audio jack connector are shown in **Figure 2-7** below.

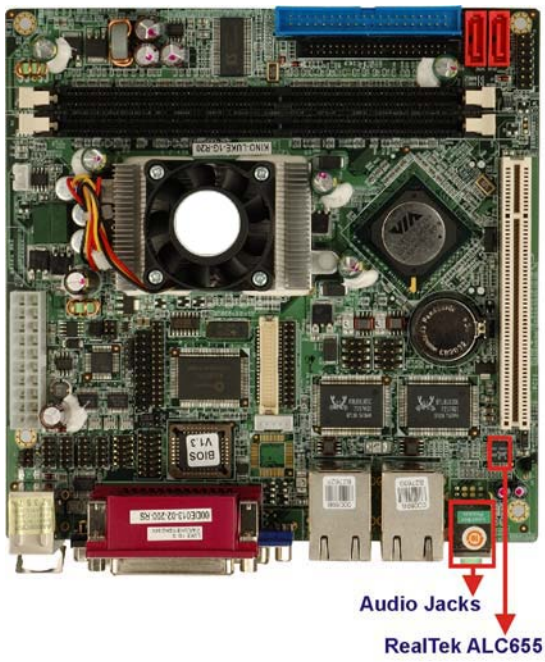

Figure 2-7: Audio Chipset and Connectors

2.5.3 VIA® VT8237R Plus IDE Interface

The integrated IDE interface on the VIA® VT8237R Plus southbridge supports four IDE hard disks and ATAPI devices. PIO IDE transfers up to 16MB/s and Ultra ATA transfers of 133MB/s. The integrated IDE interface is able to support the following IDE HDDs:

- Ultra ATA/133, with data transfer rates up to 133MB/s
- Ultra ATA/100, with data transfer rates up to 100MB/s
- Ultra ATA/66, with data transfer rates up to 66MB/s

Specification	Ultra ATA/133	Ultra ATA/100	Ultra ATA/66
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 3 – 4
DMA/UDMA Max Transfer	133MB/s	100MB/s	66MB/s
Controller Interface	5V	5V	5V

Table 2-1: Supported HDD Specifications

The four drives can are interfaced to the Southbridge through two box connectors.

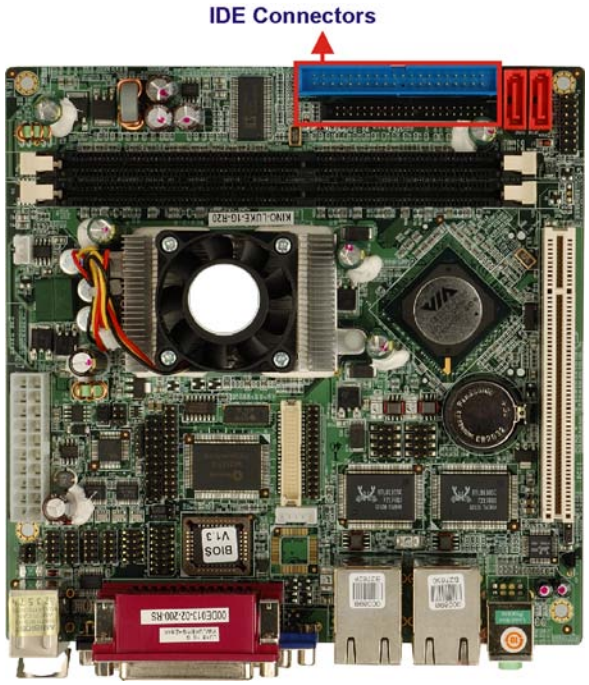

Figure 2-8: IDE Connectors

2.5.4 VIA® VT8237R Plus SATA Support

The SATA controller on the VIA® VT8237R Plus Southbridge supports two full duplex 1.5 Gbps dual channel SATA drives. The V-RAID serial RAID controller enables the drives to be configured in a RAID 0, RAID 1, RAID 0+1 or JBOD configuration. The V-RAID has a user-friendly Windows-based V-RAID software interface. The two SATA drive connectors are shown in **Figure 2-9**.

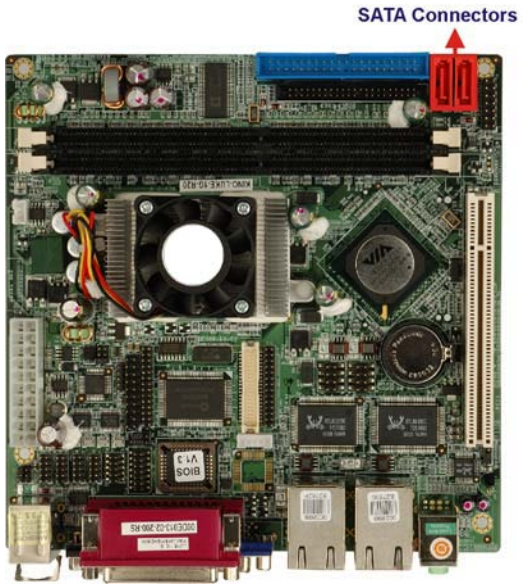

Figure 2-9: 1.5Gbps SATA Drive Connectors

2.5.5 VIA® VT8237R Plus USB Controller

The VIA® VT8237R Plus Southbridge USB 2.0 Controller supports eight USB 2.0/1.1 ports. Four of these ports are external connectors. The remaining four ports are interfaced to the Southbridge through two 8-pin header connectors. The connectors are show in below.

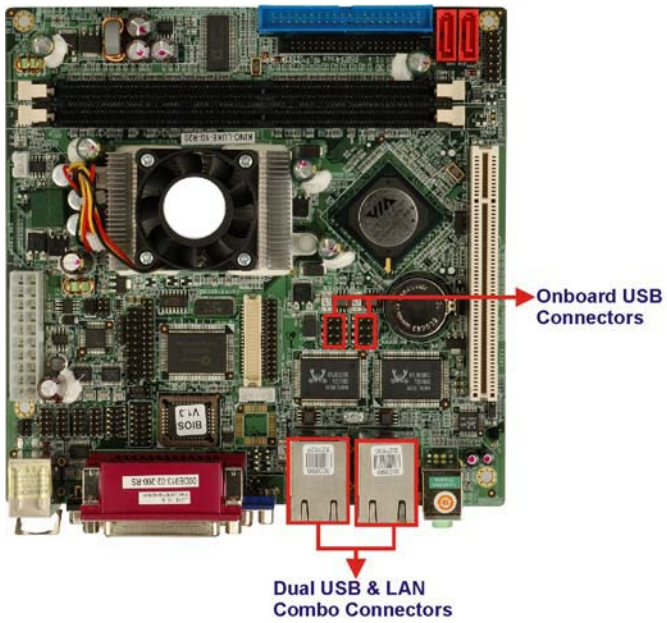

Figure 2-10: USB Connectors

2.5.6 VIA® VT8237R Plus Low Pin Count (LPC) Interface

The VIA® VT8237R Plus LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH6 is connected to the following components:

- BIOS chipset
- Super I/O chipset
- Serial port chipset

2.5.7 VIA® VT8237R Plus PCI Interface

The PCI interface on the VIA® VT8237R Plus is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33MHz
- 5V tolerant PCI signals (except PME#)

The PCI bus is connected to one PCI expansion slot and two RealTek RTL8110SC PCI GbE controllers.

2.6 LPC Bus Components

2.6.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset
- LPC to 4 UART chipset
- TPM module connector

The LPC bus components are shown in **Figure 2-11** below.

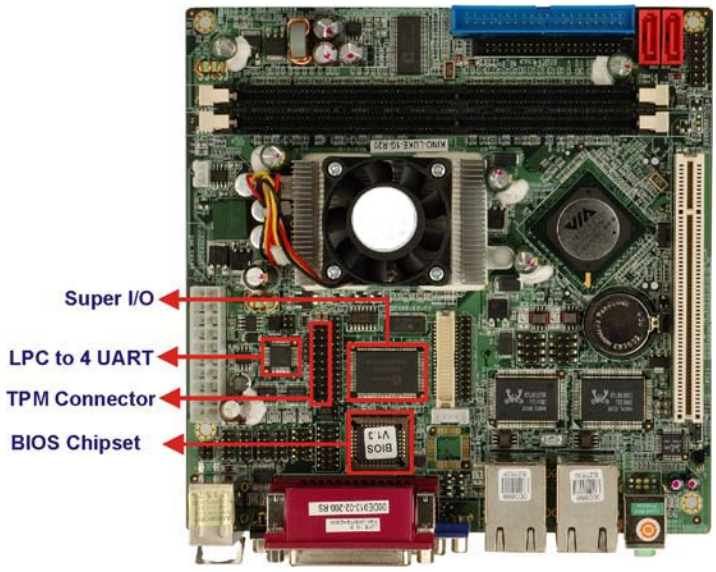

Figure 2-11: LPC Bus Components

2.6.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support

- PXE (Pre-boot Execution Environment) support
- USB booting support

2.6.3 Super I/O chipset

The Winbond W83697HG Super I/O chipset is connected to the VIA VT8237R-Plus southbridge through the LPC bus. The Winbond W83697HG is an LPC interface-based Super I/O device that comes with Environment Controller integration, floppy disk controller, UART controller and IR controller. Some of the features of the Winbond W83697HG chipset are listed below:

- LPC Spec. 1.01 compliant
- LDRQ# (LPC DMA) and SERIRQ (serial IRQ) supported
- Hardware monitor functions integrated
- Microsoft PC98/PC99 Hardware Design Guide compliant
- ACPI DPM (Device Power Management) supported

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

2.6.3.1 Super I/O LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.01. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.6.3.2 Super I/O 16C550 UARTs

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

- Two standard serial ports (COM1 and COM2)
- 16-byte send/receive FIFO
- MIDI compatible

One UART is interfaced to an RS-232 serial connector (COM1). The second UART is interfaced to an RS-232, RS-422, or RS-485 connector (COM2).

2.6.3.3 Super I/O Infrared

The onboard Super I/O supports the following infrared specifications:

- IrDA version 1.0 SIR protocol with a maximum baud rate up to 115.2Kbps
- SHARP ASK-IR protocol with a baud rate up to 57,600bps
- Consumer IR with Wake-up function

The IR controller on the super I/O is interfaced to an onboard pin-header.

2.6.3.4 Super I/O Hardware Monitor Functions

The Super I/O Hardware Monitor monitors internal voltages, system temperature and the cooling fan speed. All the monitored environmental parameters can be read from the BIOS Hardware Health Configuration menu.

2.6.3.5 Super I/O Parallel Port

The Super I/O parallel port (LPT) is compatible with the following LPT specifications.

- IBM parallel port compatible
- PS/2 compatible bi-directional parallel port
- Enhanced Parallel Port (EPP) mode supported. Compatible with IEEE 1284 specifications
- Extended Parallel Port (EPP) mode supported. Compatible with IEEE 1284 specifications
- Enhanced printer port back-drive current protection

The parallel port controller is connected to an external DB-26 LPT connector.

2.6.3.6 Super I/O Floppy Disk Drive (FDD) Controller

The Super I/O FDD controller is compatible with the following specifications.

- IBM PC AT disk drive compatible
- Variable write pre-compensation with track selectable capability
- Vertical recording format supported
- DMA logic enabled

- 16-byte data FIFOs
- Overrun and under run conditions detected
- Built-in address mark detection circuitry to simplify the read electronics
- FDD anti-virus functions with software write protect and FDD write enable signal
- Supports 3.5-inch or 5.25-inch FDD
- Compatible with industry standard 82077
- Supported capacities:
  - 360K
  - 720K
  - 1.2M
  - 1.44M
  - 2.88M
- Supported transfer rates
  - 250Kbps
  - 300Kbps
  - 500Kbps
  - 500Kbps
  - 1Mbps
  - 2Mbps
- 3-mode FDD and Win95/98 driver supported

The FDD controller is interfaced to an onboard FDD connector.

2.6.4 Serial Port Chipset

The IMBA-X9654 has a Fintek F81216DG chipset onboard enables the addition of four additional UART serial ports (COM3, COM4, COM5 and COM6). UART includes 16-byte send/receive FIFO. The Fintek serial port chipset is interfaced to the southbridge chipset through the LPC bus. Some of the features of the Fintek chipset are listed below:

- Supports LPC interface
- Totally provides 4 UART (16550 asynchronous) ports
  - 3 x Pure UART
  - 1 x UART+IR
- One Watch dog timer with WDTOUT# signal

- One Frequency input 24/48MHz
- Powered by 3Vcc

2.6.5 TPM Module

A TPM connector on the 2801340 is interfaced to the VIA® VT8237 Plus southbridge through the LPC bus. The VIA® VT8237 Plus southbridge supports TPM version 1.1 and TPM version 1.2 devices for enhanced security. Three TPM are available from Global American. The three TPMs are listed below:

- 1007790 Infineon TPM module
- 1007800 Sinosun TPM module
- 1007810 Winbond TPM module

For more information about these modules please refer to Chapter 3 or contact Global American, Inc. at (603) 886-3900, Toll Free (US only) (800) 833-8999.

2.7 PCI Bus Components

2.7.1 PCI Bus Overview

The PCI bus is connected to components listed below:

- 1 x PCI expansion slot
- 2 x PCI GbE controllers

The PCI bus components are shown in **Figure 2-12** below.

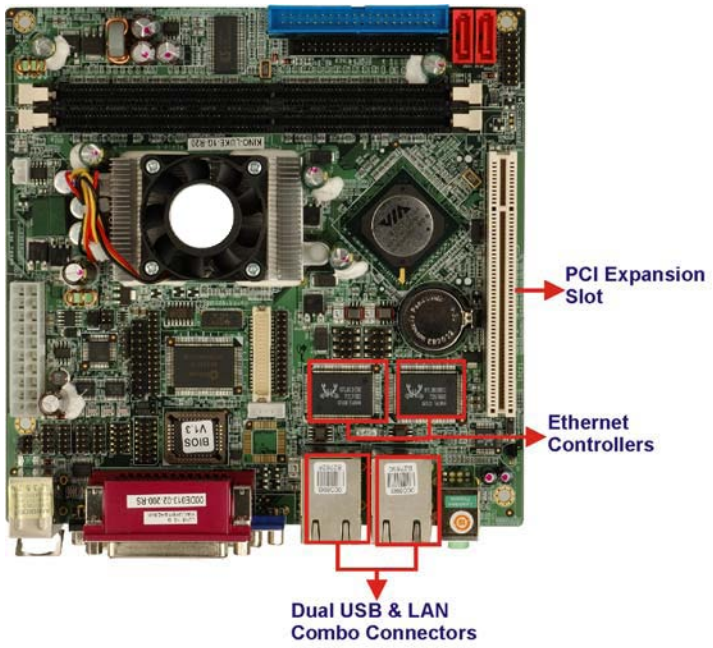

Figure 2-12: PCI Bus Components

2.7.2 PCI Slot

A compatible Revision 2.3 PCI expansion card can be installed into the PCI expansion slot.

2.7.3 PCI GbE Connectivity

Two RealTek RTL8110SC PCI GbE controllers connect to external RJ-45 LAN connectors to the Southbridge chipset through the PCI bus. Some of the features of the controllers are listed below:

- Integrated 10/100/1000 transceiver
- Auto-Negotiation with Next Page capability
- Supports PCI rev.2.3, 32-bit, 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 802.1P Layer 2 Priority Encoding
- Supports IEEE 802.1Q VLAN tagging
- Serial EEPROM
- 3.3/1.8/1.5V signaling, 5V PCI I/O tolerant
- 0.15µm CMOS process
- Transmit/Receive FIFO (8K/64K) support
- Supports power down/link down power saving
- Supports PCI Message Signaled Interrupt (MSI)

2.8 Environmental and Power Specifications

2.8.1 System Monitoring

Three thermal inputs on the 2801340 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- CPU Temperature
- System Temperature

Fan Speed Monitoring: The following system fan speeds are monitored:

- CPU FAN Speed

Three voltage inputs on the 2801340 Super I/O Enhanced Hardware Monitor monitor the following voltages:Vcore

- +1.8V
- +3.3Vin
- +5Vin

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

2.8.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the 2801340 are listed below.

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

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

2.8.3 Power Consumption

Table 2-2 shows the power consumption parameters for the 2801340 running with a 1.0GHz VIA® LUKE processor and 256MB of 400MHz SDRAM.

Voltage	Current
12V	0.15A
5.0V	4.09A

Table 2-2: Power Consumption

THIS PAGE IS INTENTIONALLY LEFT BLANK

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the 2801340 may result in permanent damage to the 2801340 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 2801340. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 2801340, 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 2801340, place it on an antic-static pad. This reduces the possibility of ESD damaging the 2801340.
- *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 2801340 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 2801340 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. Contact Global American, Inc. at (603) 886-3900 or Toll Free (US only) at (800) 833-8999.

3.3.1 Package Contents

The 2801340 is shipped with the following components:

Quantity	Item and Part Number	Image
1	2801340	
1	IDE-cable	
2	SATAcables	
1	SATApower cable	

1	Dual RS-232 cable	
1	I/O Shielding for VGA models	
1	I/O Shielding for DVI models	
1	DVI-VGA Adaptor for DVI models	
1	Mini jumper pack	
1	Quick installation guide	
1	Utility CD	

Table 3-1: Package List Contents

3.3.2 Optional Items

NOTE:

The items listed in this section are optional items that must be ordered separately. Please contact Global American, Inc. for additional purchases at (603) 886-3900 or Toll Free (US only) (800) 833-8999.

The following optional items are available for the 2801340.

Quantity

	Item and Part Number	**Image**
1	P/N: 3907720	
1	Dual USB cable (w bracket) **P/N**: 1207793	
1	ATA/33 44p/44p Flat Cable **P/N**: 1208470	

Table 3-2: Optional Items

THIS PAGE IS INTENTIONALLY LEFT BLANK

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 0 shows peripheral interface connector locations. **Section 0** lists all the peripheral interface connectors seen in **Section 0**.

4.1.1 2801340 Layout

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

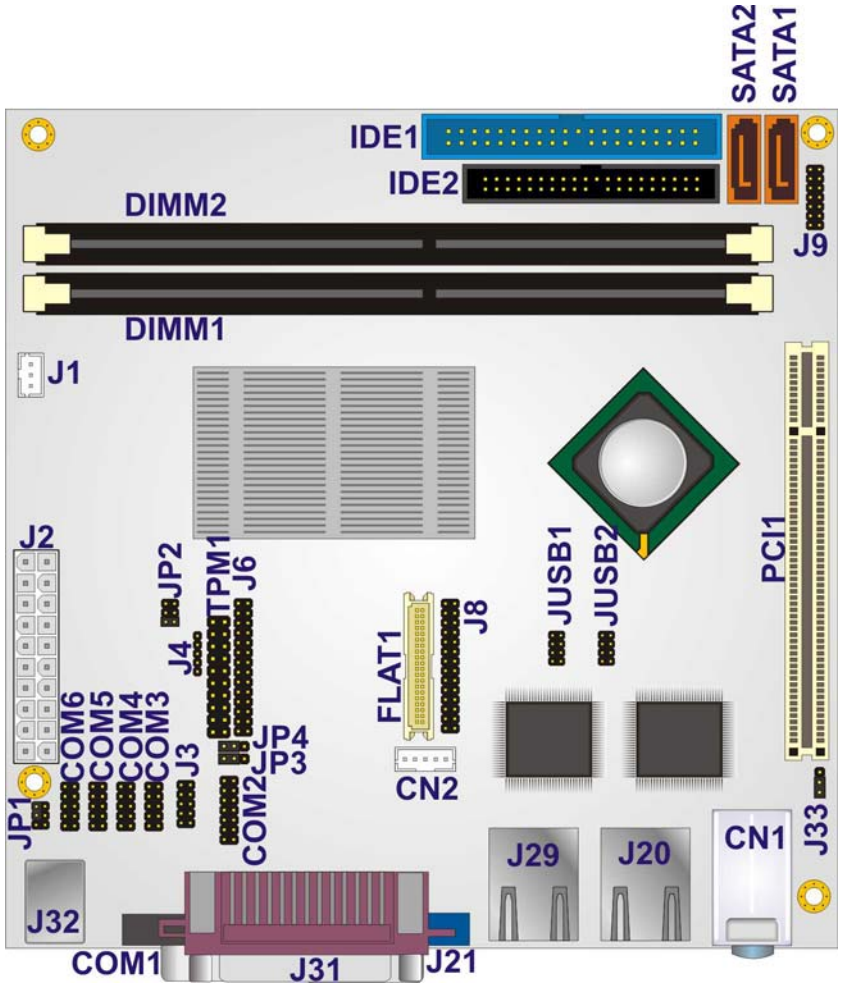

Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the 2801340. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power supply connector	20-pin ATX connector	J2
Fan connector	3-pin wafer	J1
Front panel connector	14-pin header	J9
GPIO connector	10-pin header	J3
IDE Interface connector (Primary)	40-pin header	IDE1
IDE Interface connector (Secondary)	44-pin header	IDE2
Infrared connector	5-pin header	J4
Inverter power connector	5-pin header	CN2
LVDS daughter board connector	28-pin crimp	J6
LVDS daughter board connector	28-pin crimp	J8
PCI slot	PCI1	PCI slot
RS-232/422/485 serial port connector (COM2)	14-pin header	COM2
RS-232 serial port connector (COM3)	10-pin header	COM3
RS-232 serial port connector (COM4)	10-pin header	COM4
RS-232 serial port connector (COM5)	10-pin header	COM5
RS-232 serial port connector (COM6)	10-pin header	COM6
Serial ATA (SATA) connector	7-pin SATA connector	SATA1
Serial ATA (SATA) connector	7-pin SATA connector	SATA2
TPM connector	20-pin header	TPM1

Connector	Type	Label
TTL LCD connector	40-pin crimp	FLAT1
USB connector (USB4 and USB5)	8-pin header	JUSB1
USB connector (USB6 and USB7)	8-pin header	JUSB2

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the 2801340. Detailed descriptions of these connectors can be found in **Section** 0 on **page 61**

Connector	Type	Label
Audio	3-in-1 phone jack	CN1
Ethernet connector	RJ-45	J29
Ethernet connector	RJ-45	J20
Keyboard and mouse connector	Dual PS/2	J32
Parallel Port Connector	DB-26	J31
RS-232 serial port connector	DB-9 (male)	COM1
USB port	USB port	J29
USB port	USB port	J30
VGA port connector	Female DB-15	J21

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 2801340.

4.2.1 ATX Power Connector

CN Label: J2

CN Type: 20-pin ATX (2x10)

CN Location: See Figure 4-2

CN Pinouts: See Table 4-3

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.

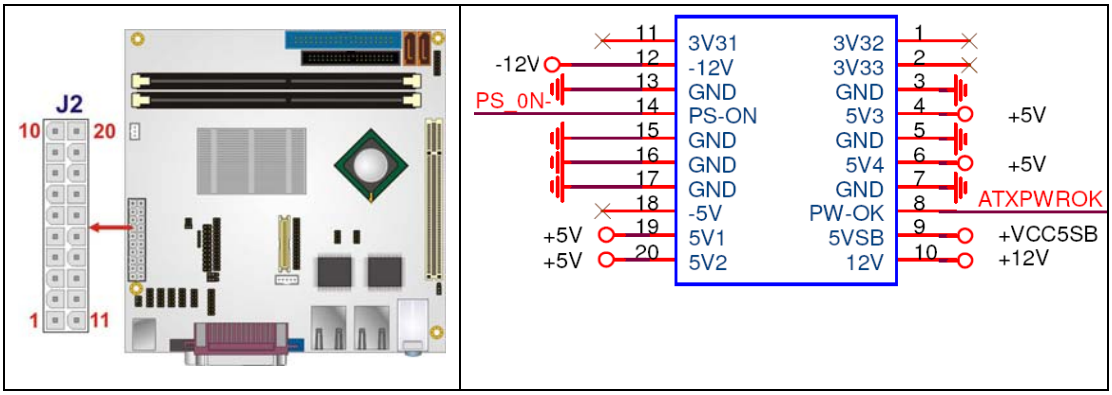

Figure 4-2: ATX Power Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	N/C	11	N/C
2	N/C	12	-12V
3	GND	13	GND
4	+5V	14	PS-ON
5	GND	15	GND

6	+5V	16	GND
7	GND	17	GND
8	PW-OK	18	-5V
9	+VCC5SB	19	+5V
10	+12V	20	+5V

Table 4-3: ATX Power Connector Pinouts

4.2.2 Backlight Inverter Connector

CN Label: CN2

CN Type: 5-pin wafer (1x5)

CN Location: See Figure 4-3

CN Pinouts: See Table 4-4

The backlight inverter connector provides the backlight on the LCD display connected to the 2801340 with +12V of power.

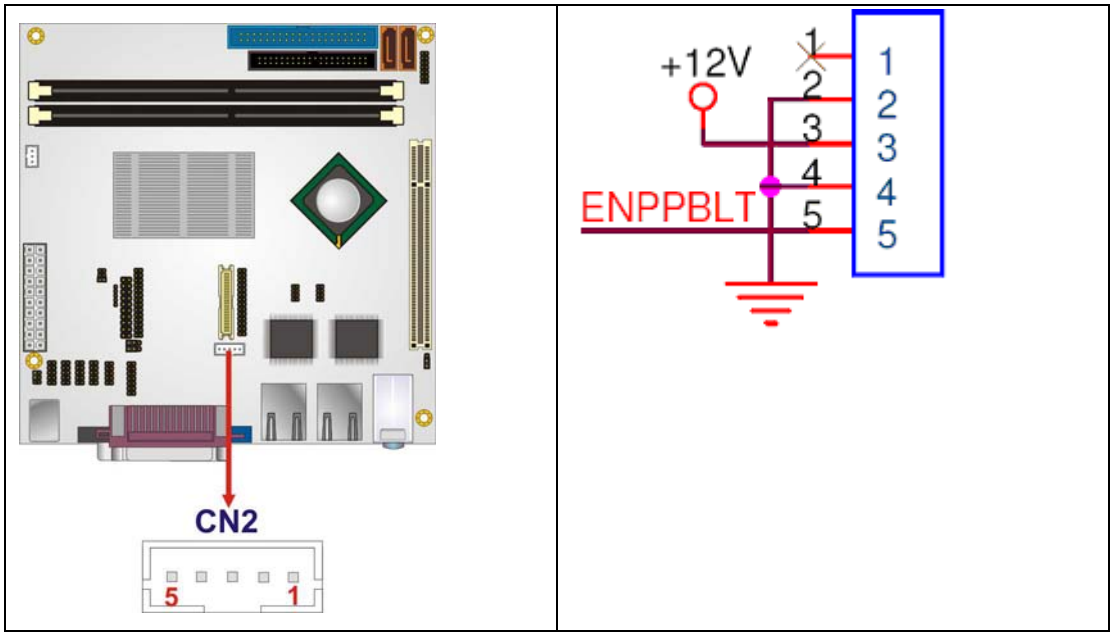

Figure 4-3: Panel Backlight Connector Pinout Locations

PIN NO.	DESCRIPTION
1	N/C
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT ENABLE

Table 4-4: Panel Backlight Connector Pinouts

4.2.3 Fan Connector (+5V)

CN Label: J1

CN Type: 3-pin header

CN Location: See Figure 4-4

CN Pinouts: See Table 4-5

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.

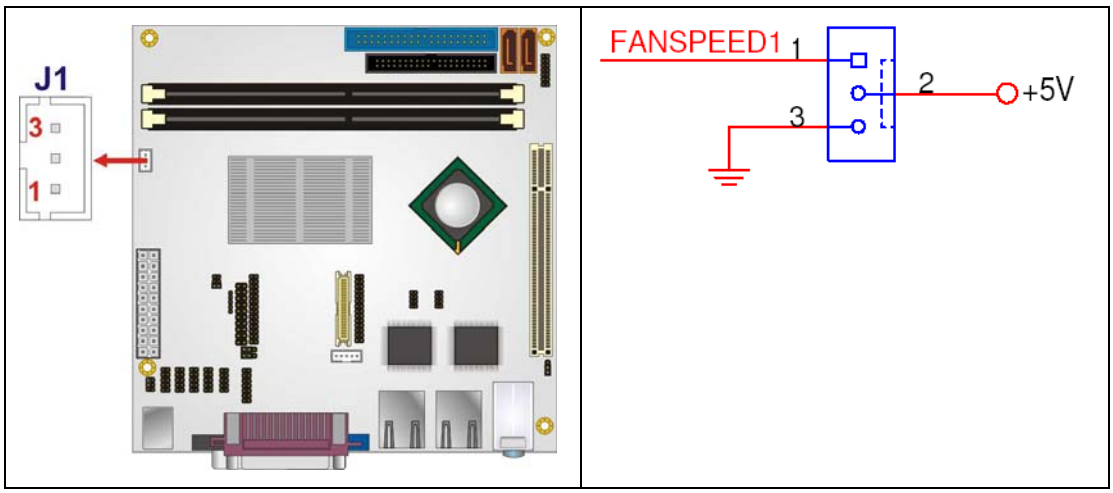

Figure 4-4: +5V Fan Connector Location

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

Table 4-5: +5V Fan Connector Pinouts

4.2.4 Front Panel Connector (14-pin)

CN Label: J9

CN Type: 14-pin header (2x6)

CN Location: See Figure 4-5

CN Pinouts: See Table 4-6

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

- Power button
- Reset button
- Power LED
- HDD LED

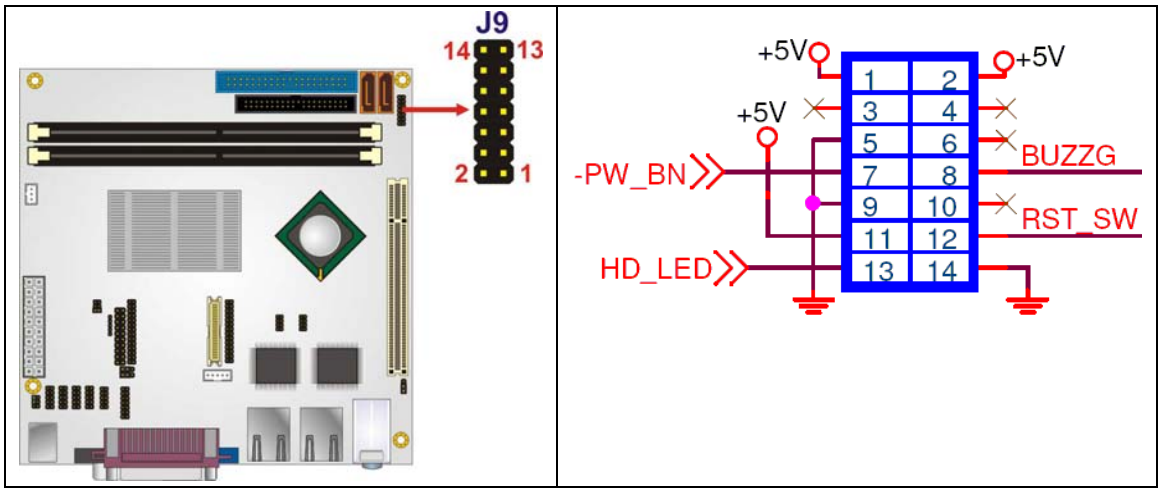

Figure 4-5: Front Panel Connector Pinout Locations

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	+5V	Speaker	2	+5V
	3	N/C		4	N/C
	5	Ground		6	N/C
Power Button	7	PWRBTN-		8	Speaker
	9	GND	Reset	10	N/C
HDD LED	11	+5V		12	Reset-
	13	HDD LED-		14	GND

Table 4-6: Front Panel Connector Pinouts

4.2.5 GPIO Connector

CN Label: J3

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-6

CN Pinouts: See Table 4-7

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

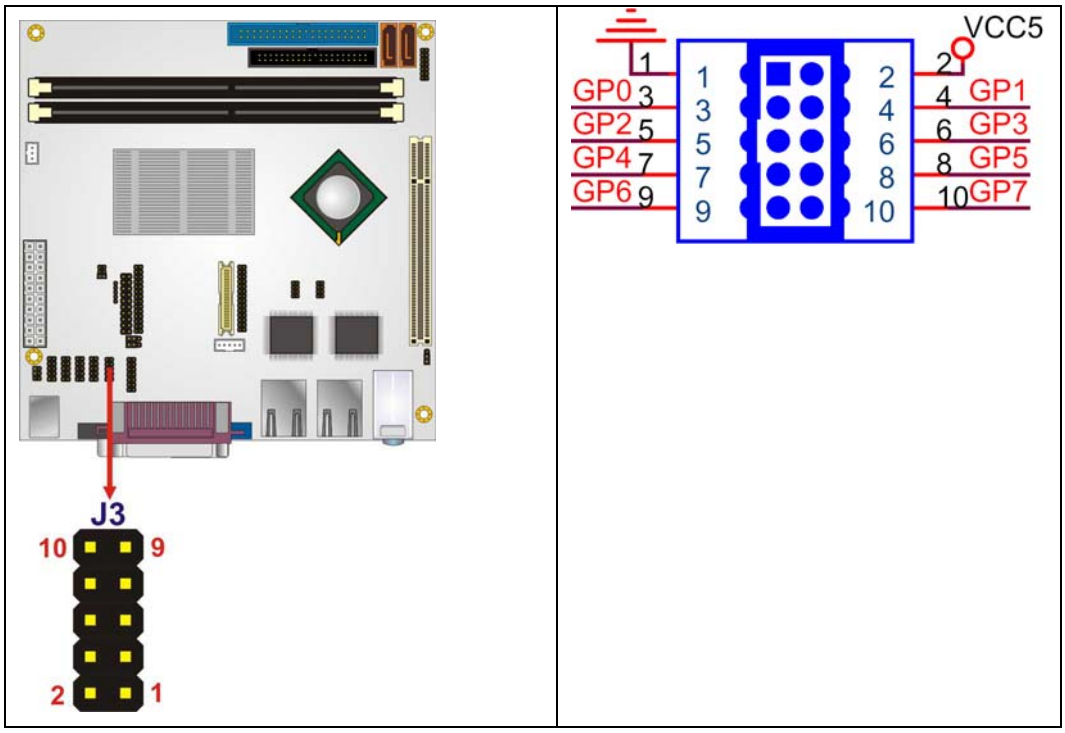

Figure 4-6: GPIO Connector Pinout Locations

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 4-7: GPIO Connector Pinouts

4.2.6 IDE Connector (40-pin)

CN Label: IDE1

CN Type: 40-pin header (2x20)

CN Location: See Figure 4-7

CN Pinouts: See Table 4-8

One 40-pin IDE device connector on the 2801340 supports connectivity to two hard disk drives.

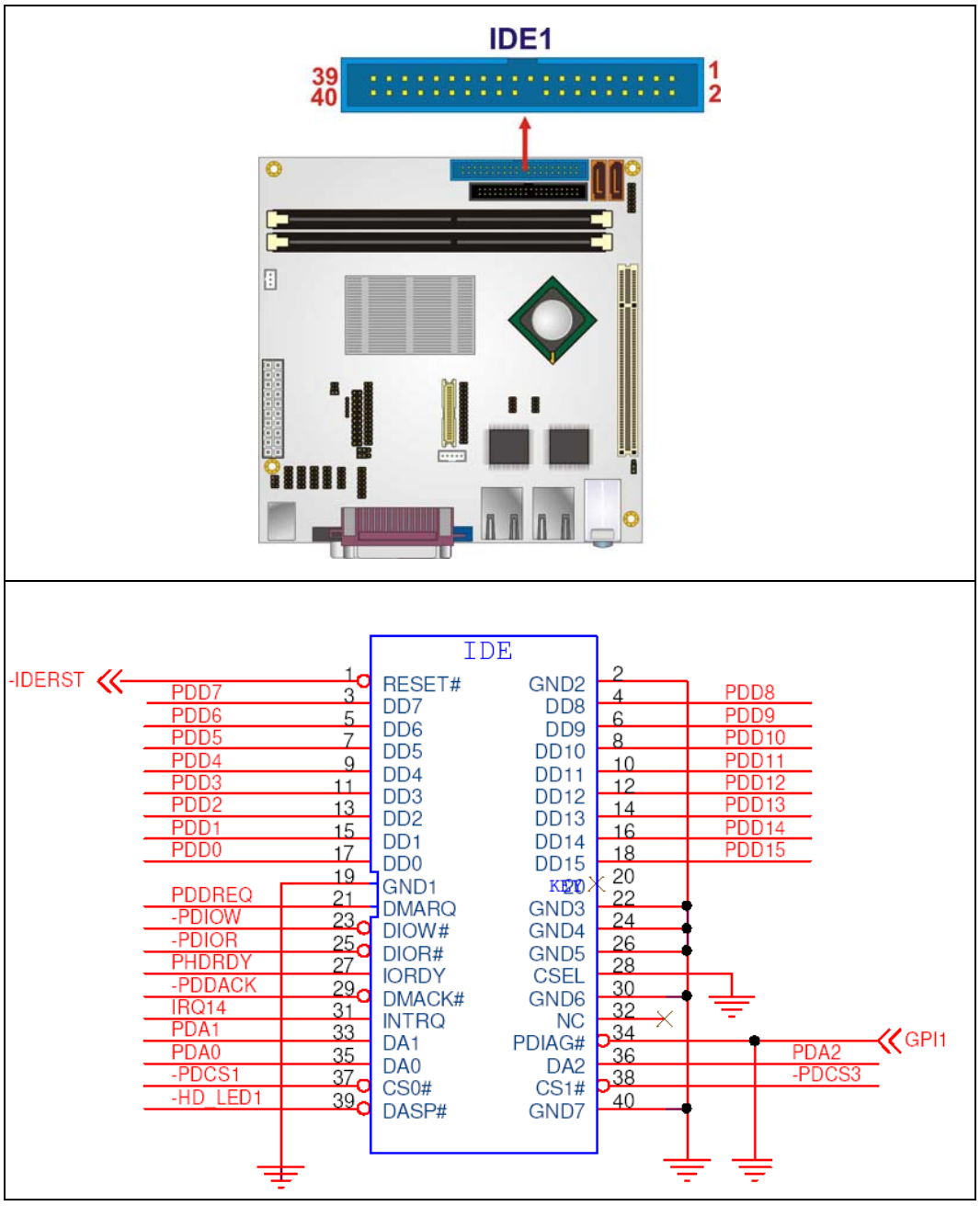

Figure 4-7: IDE Device Connector Locations

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 4-8: IDE Connector Pinouts

4.2.7 IDE Connector(44-pin)

CN Label: IDE2

CN Type: 44-pin header (2x22)

CN Location: See Figure 4-8

CN Pinouts: See Table 4-9

One 44-pin IDE device connector on the 2801340 supports connectivity to two hard disk drives.

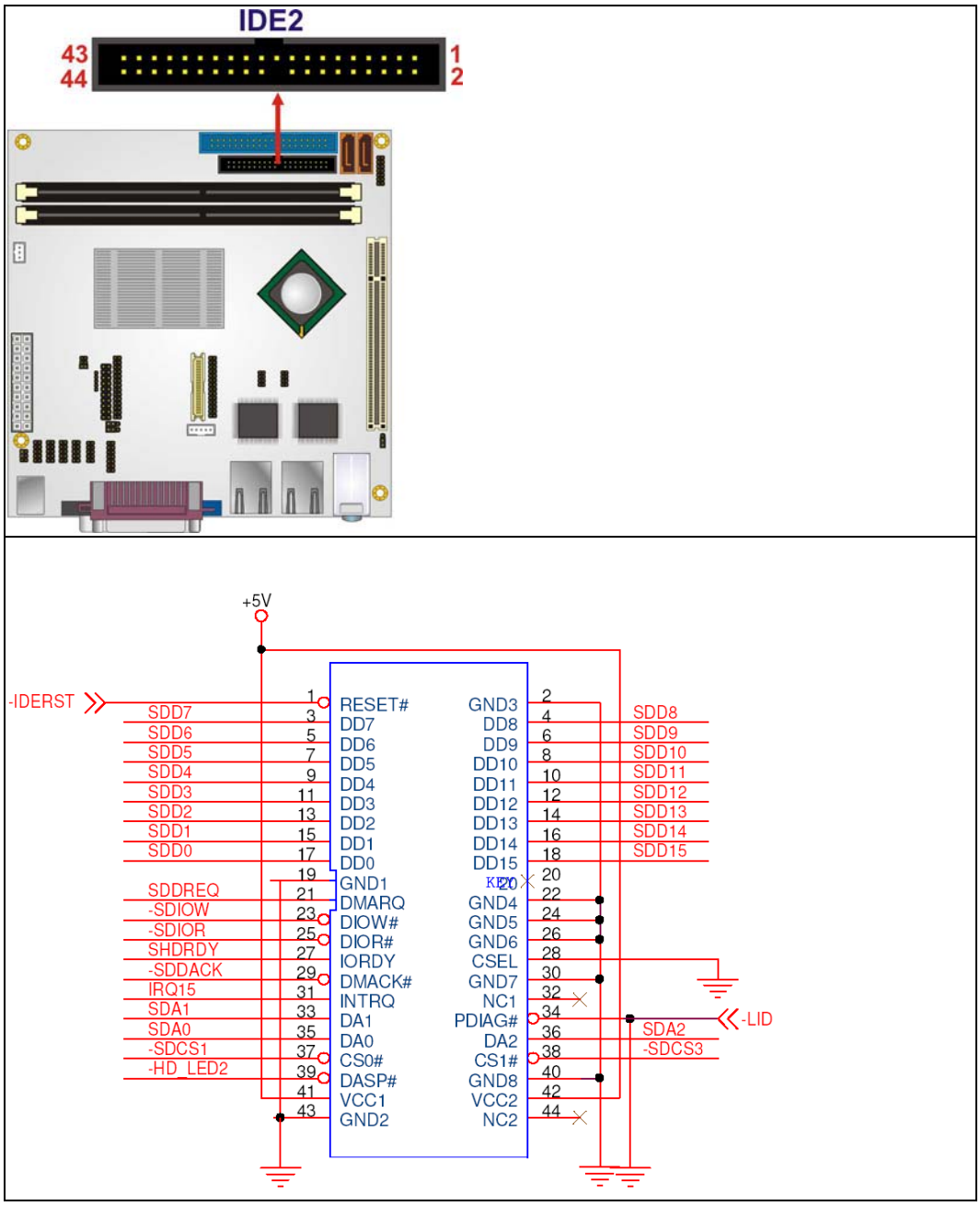

Figure 4-8: Secondary IDE Device Connector Locations

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 4-9: Secondary IDE Connector Pinouts

4.2.8 Infrared Interface Connector (5-pin)

CN Label: J4

CN Type: 5-pin header (1x5)

CN Location: See Figure 4-9

CN Pinouts: See Table 4-10

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

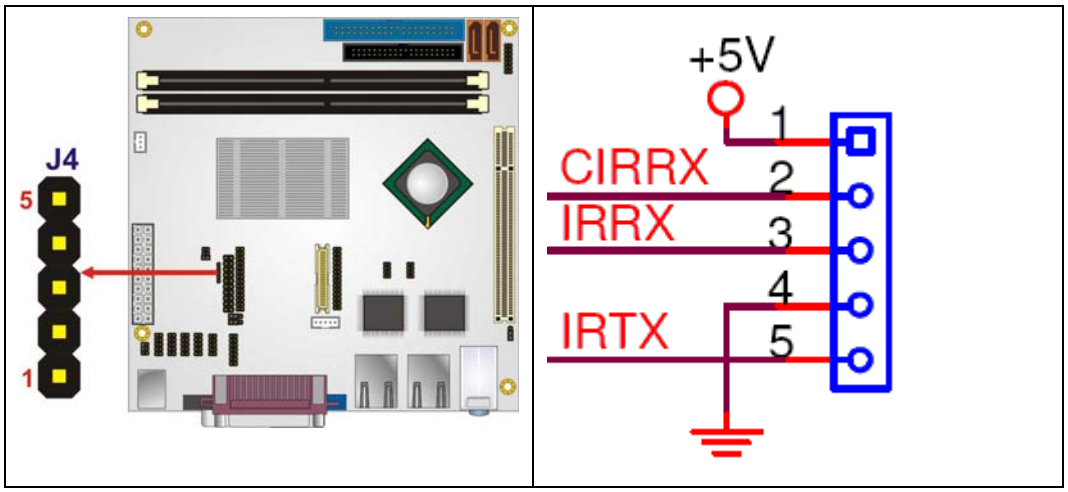

Figure 4-9: Infrared Connector Pinout Locations

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

Table 4-10: Infrared Connector Pinouts

4.2.9 LCD LVDS Converter Module Connector 1

CN Label: J6

CN Type: 28-pin header (2x14)

CN Location: See Figure 4-10

CN Pinouts: See Table 4-11

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

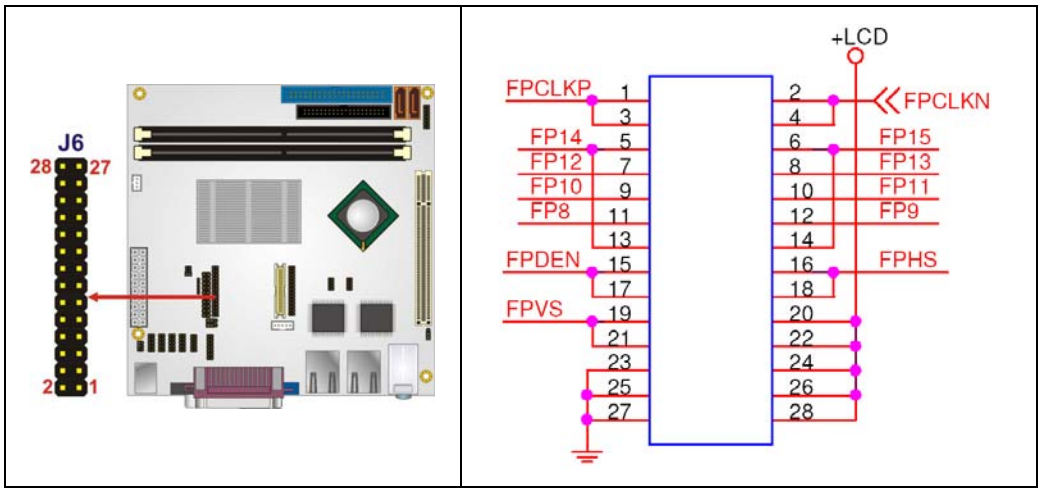

Figure 4-10: LVDS Converter Module Connector 1 Locations

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 4-11: LVDS Converter Module Connector 1 Pinouts

4.2.10 LCD LVDS Converter Module Connector 2

CN Label: J8

CN Type: 28-pin header (2x14)

CN Location: See Figure 4-11

CN Pinouts: See Table 4-12

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

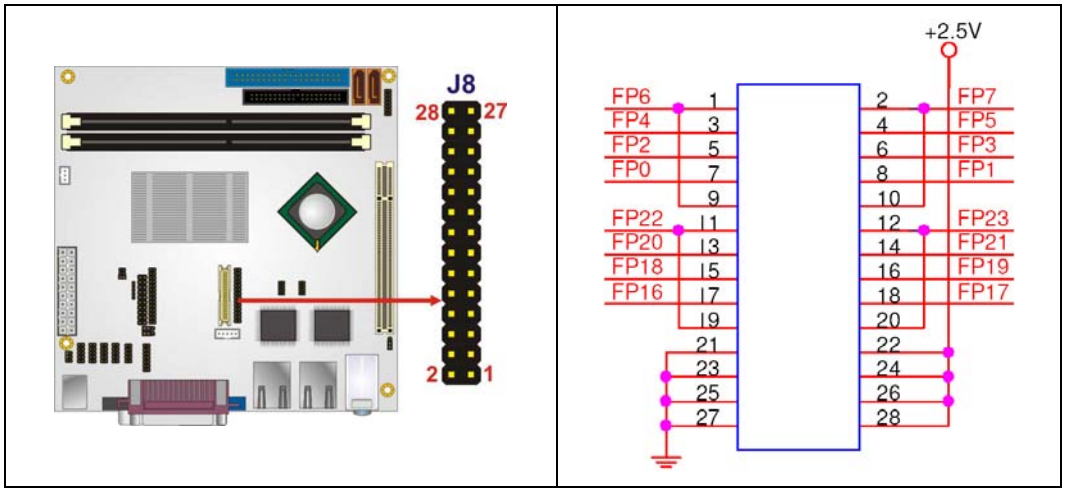

Figure 4-11: LVDS Converter Module Connector 2 Locations

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

PIN	DESCRIPTION	PIN	DESCRIPTION
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 4-12: LVDS Converter Module Connector 2 Pinouts

4.2.11 LVDS LCD Connector (Optional 3907720)

CN Label: **CN20**

CN Type: 30-pin crimp (2x10)

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

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

The 30-pin LVDS LCD connector can be connected to single channel or dual channel, 18-bit or 36-bit LVDS panel.

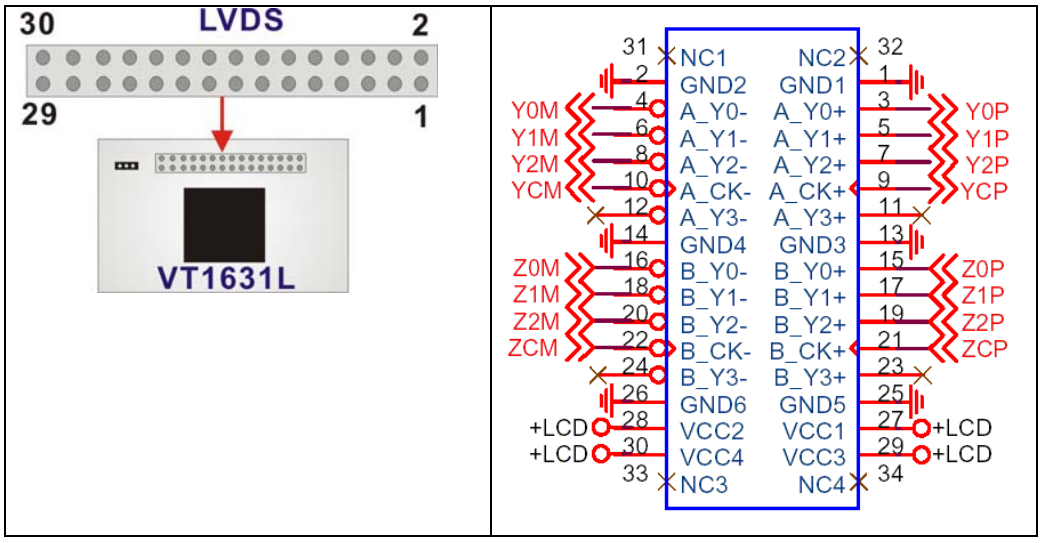

Figure 4-12: LVDS LCD Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	2	GROUND
3	LVDSA_Y0+	4	LVDSA_Y0-
5	LVDSA_Y1+	6	LVDSA_Y1-
7	LVDSA_Y2+	8	LVDSA_Y2-
9	LVDSA_CLK+	10	LVDSA_CLK-
11	N/C	12	N/C
13	GROUND	14	GROUND
15	LVDSB_Y0+	16	LVDSB_Y0-
17	LVDSB_Y1+	18	LVDSB_Y1-
19	LVDSB_Y2+	20	LVDSB_Y2-
21	LVDSB_CLK+	22	LVDSB_CLK-
23	N/C	24	N/C
25	GROUND	26	GROUND
27	VCC_LVDS	28	VCC_LVDS
29	VCC_LVDS	30	VCC_LVDS

Table 4-13: LVDS LCD Port Connector Pinouts

4.2.12 SATA Drive Connectors

CN Label: SATA1 and SATA2

CN Type: 7-pin SATA drive connectors

CN Location: See Figure 4-13

CN Pinouts: See Table 4-14

The two SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150Mb/s. The SATA drives can be configured in a RAID configuration.

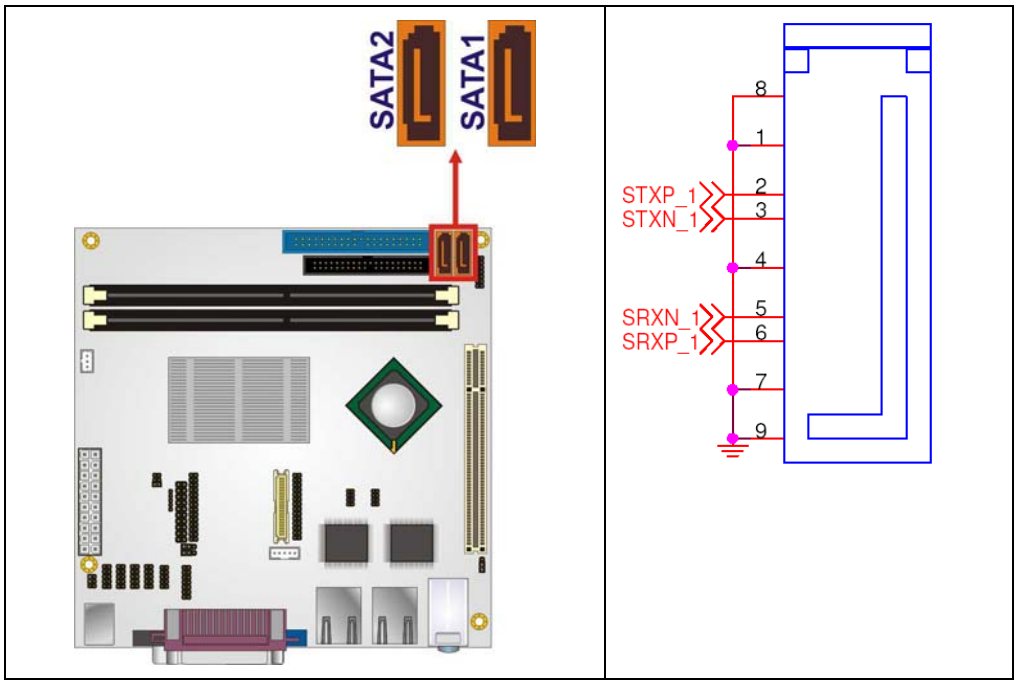

Figure 4-13: SATA Drive Connector Locations

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

Table 4-14: SATA Drive Connector Pinouts

4.2.13 Trusted Platform Module (TPM) Connector

CN Label: TPM1

CN Type: 40-pin header (2x20)

CN Location: See Figure 4-14

CN Pinouts: See Table 4-15

The Trusted Platform Module (TPM) connector secures the system on bootup.

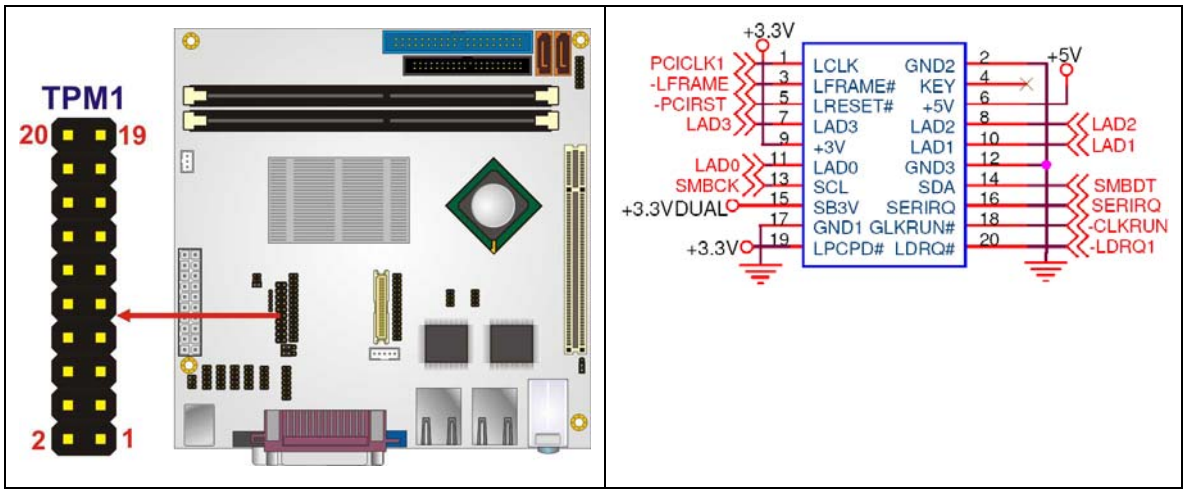

Figure 4-14: TPM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND2
3	LFRAME#	4	KEY
5	LRESET#	6	+5V
7	LAD3	8	LAD2
9	+3V	10	LAD1
11	LAD0	12	GND3
13	SCL	14	SDA
15	SB3V	16	SERIRQ
17	GND1	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 4-15: TPM Connector Pinouts

4.2.14 Serial Port Connector (COM 2)(RS-232, RS-422 or RS-485)

CN Label: COM2

CN Type: 14-pin header (2x7)

CN Location: See Figure 4-15

CN Pinouts: See Table 4-16

The 14-pin serial port connector connects to the COM 2 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.

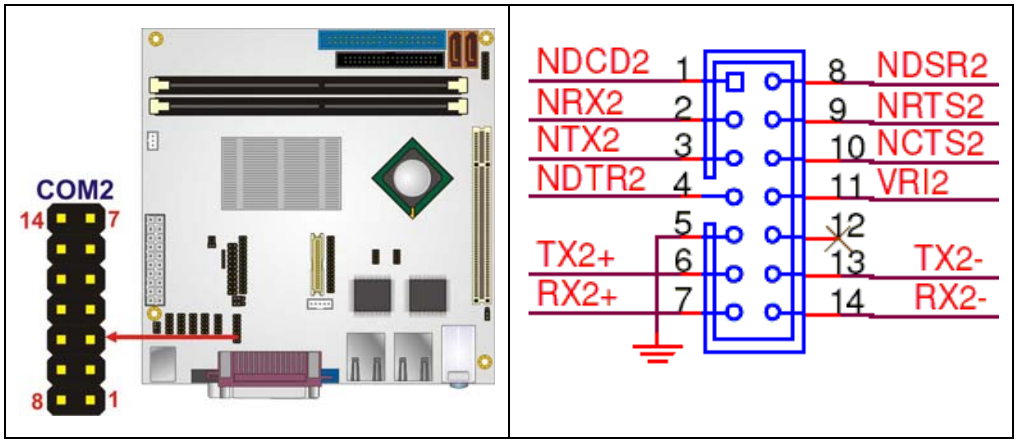

Figure 4-15: RS-232/422/485 Serial Port Connector Location

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

Table 4-16: RS-232/RS-485 Serial Port Connector Pinouts

4.2.15 Serial Port Connectors (COM3, COM4, COM5 and COM6)

CN Label: COM3, COM4, COM5 and COM6

CN Type: 10-pin header (2x5)

CN Location: See Figure 4-16

CN Pinouts: See Table 4-17

The 10-pin serial port connectors provide four additions RS-232 serial communication channels. The serial port connectors can be connected to external RS-232 serial port devices.

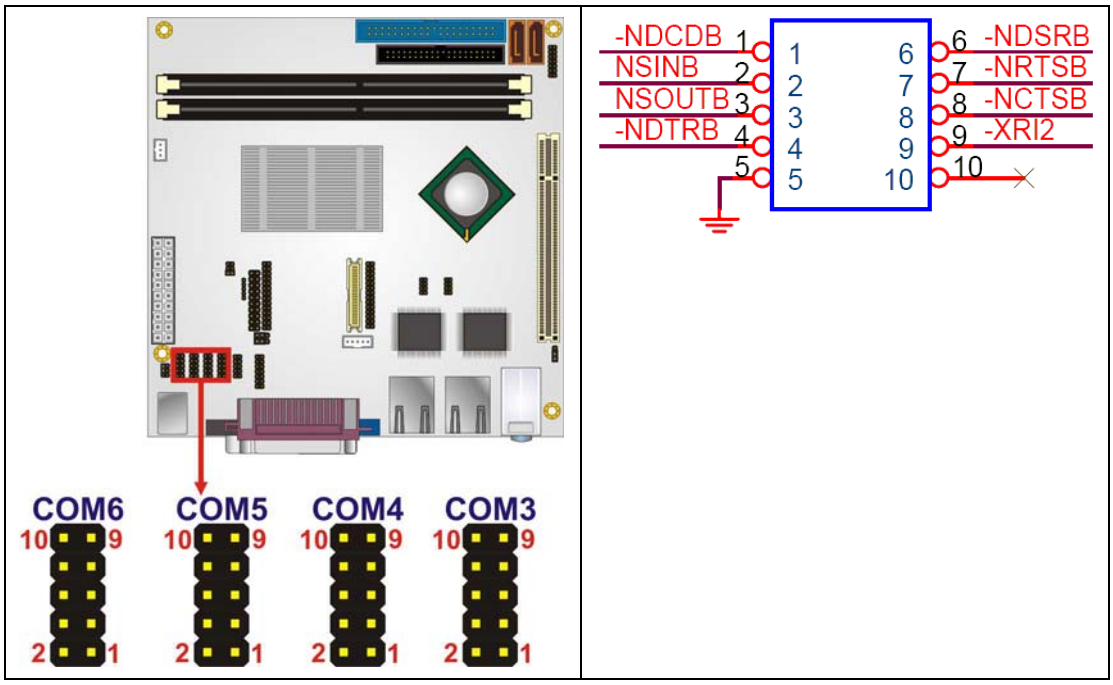

Figure 4-16: COM3, COM4, COM5 and COM6 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Detect (DCD)	6	Data Set to Ready (DSR)
2	Receive Data (RXD)	7	Request to Send (RTS)
3	Transmit Data (TXD)	8	Clear to Sent (CTS)
4	Data Terminal Ready (DTR)	9	Ring Indicator (RI)
5	Ground (GND)	10	GND

Table 4-17: COM3, COM4, COM5 and COM6 Connector Pinouts

4.2.16 USB Connectors (Internal)

CN Label: JUSB1 and JUSB2

CN Type: 8-pin header (2x4)

CN Location: See Figure 4-17

CN Pinouts: See Table 4-18

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

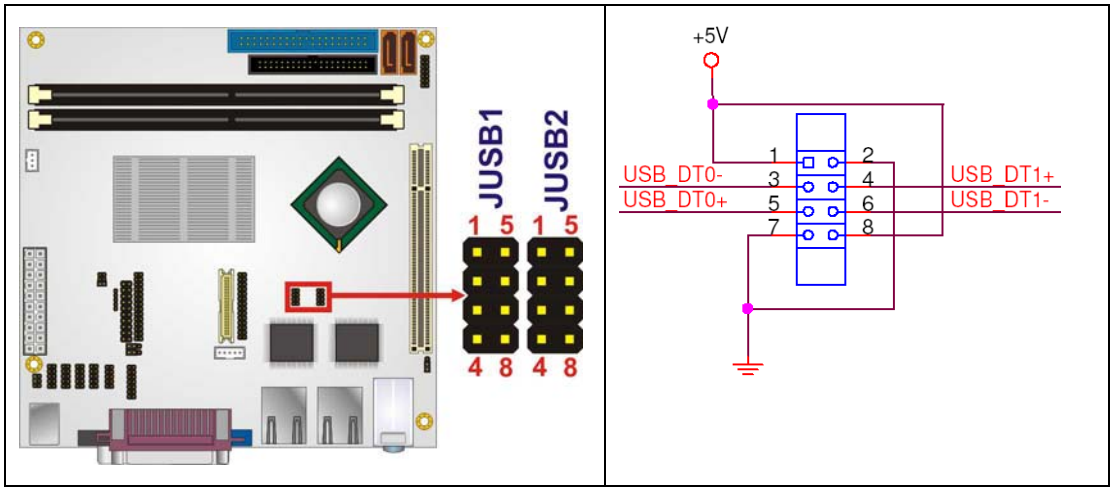

Figure 4-17: USB Connector Pinout Locations

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

Table 4-18: USB Port Connector Pinouts

4.3 External Peripheral Interface Connector (EPIC) Panel

Figure 4-18 shows the 2801340 EPIC panel. The 2801340 EPIC panel consists of the following components:

- 1 x Audio connector (dual audio jacks)
- 1 x DVI connector
- 1 x Keyboard and mouse connector (dual PS/2)
- 2 x LAN connectors
- 1 x Parallel port connector
- 1 x RS-232 serial port connector
- 4 x USB connectors
- 1 x VGA connector

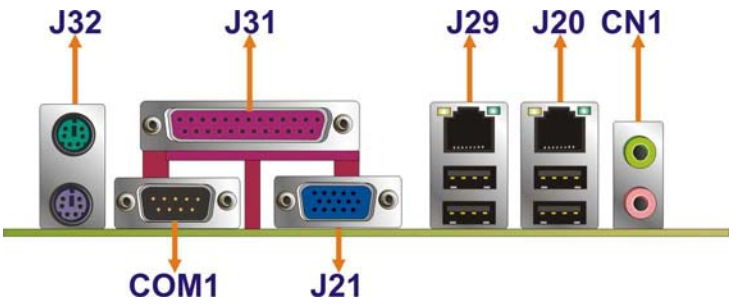

Figure 4-18: 2801340 External Peripheral Interface Connector

4.3.1 Audio Connector

CN Label: CN1

CN Type: Dual audio jacks

CN Location: See Figure 4-18

The two audio jacks on the external audio connector enable the 2801340 to be connected to external audio devices as specified below.

- Line Out port (Lime): Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.

- Microphone (Pink): Connects a microphone.

Figurea 4-19: Audio Connector

4.3.2 DVI Connector

This connector is only found on the following models:

- 2801340C (533DVI)
- 2801340D (1GDVI)

CN Label: DVI1

CN Type: DVI connector

CN Location: See Figure 4-18

CN Pinouts: See Table 4-19

The 24-pin Digital Visual Interface (DVI) connector connects to high-speed, high-resolution digital displays. The DVI-I connector supports both digital and analog signals.

PIN	Signal Name	Pin #	Signal Name	Pin #	Signal Name
1	TMDS Data2-	9	TMDS Data1-	17	TMDS Data0-
2	TMDS Data2+	10	TMDS Data1+	18	TMDS Data0+
3	GND	11	GND	19	GND
4	N/C	12	NC	20	NC
5	N/C	13	NC	21	NC
6	DDC Clock [SCL]	14	PVDD1	22	GND

7	DDC Data [SDA]	15	GND	23	TMDS Clock +
8	Analog vertical sync	16	GND	24	TMDS Clock -
C1	Analog Red	--	--	--	--
C2	Analog Green	--	--	--	--
C3	Analog Blue	--	--	--	--
C4	Analog Horizontal Sync	--	--	--	--
C5	Analog GND	--	--	--	--

Table 4-19: DVI Connector Pinouts

4.3.3 Keyboard/Mouse Connector

CN Label: CN1

CN Type: Dual PS/2

CN Location: See Figure 4-18

CN Pinouts: See Figure 4-20 and Table 4-20

The 2801340 keyboard and mouse connectors are standard PS/2 connectors.

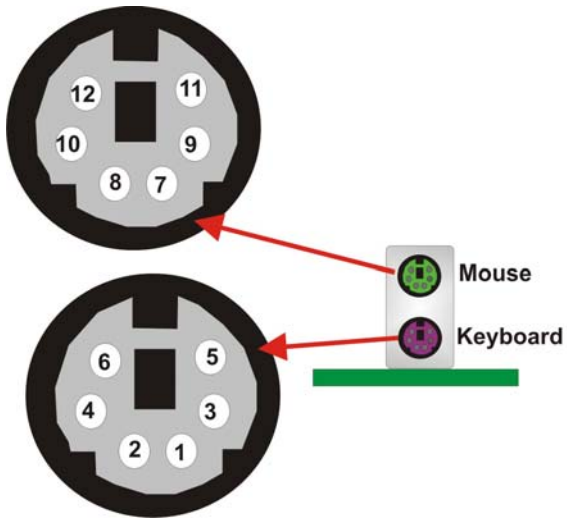

Figure 4-20: PS/2 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC
3	GND	9	GND
4	5V	10	5V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 4-20: PS/2 Connector Pinouts

4.3.4 LAN Connectors

CN Label: J20 and J21

CN Type: RJ-45

CN Location: See Figure 4-18

CN Pinouts: See Table 4-21

The 2801340 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TXA+	5	TXC-
2	TXA-	6	TXB-
3	TXB+	7	TXD+
4	TXC+	8	TXD-

Table 4-21: LAN Pinouts

Figure 4-21: 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 4-22**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
YELLOW	Activity	GREEN	Linked

Table 4-22: RJ-45 Ethernet Connector LEDs

4.3.5 Parallel Port Connector

CN Label: J31

CN Type: 25-pin DB-25 female connector

CN Location: See Figure 4-18

CN Pinouts: See Table 4-23 and Figure 4-22

The 25-pin DB-25 parallel port connector connects to a parallel port device such as a printer.

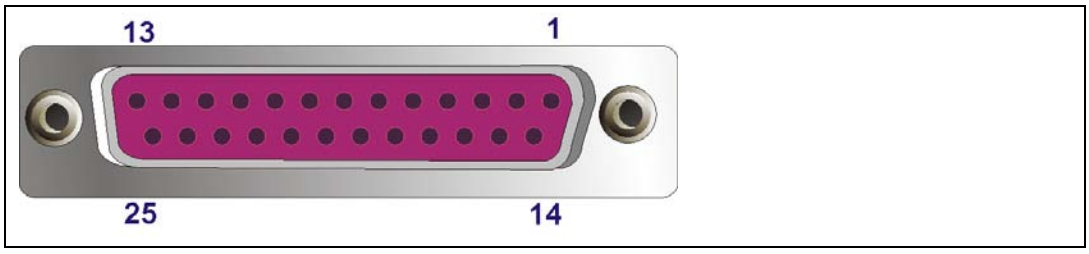

Figure 4-22: Parallel Port Connector Location

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	AUTOFORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	NC

Table 4-23: Parallel Port Connector Pinouts

4.3.6 USB Connectors

CN Label: J29 and J20

CN Type: USB port

CN Location: See Figure 4-18

CN Pinouts: See Table 4-24

The 2801340 has a one external USB 2.0 port. The port connects to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+5V	5	+5V
2	USBP4N	6	USBP5N
3	USBP4P	7	USBP5P
4	GND	8	GND

Table 4-24: USB Port Pinouts

4.3.7 Serial Port Connectors (COM1)

CN Label: COM1

CN Type: DB-9 connectors

CN Location: See Figure 4-18 (see 2)

CN Pinouts: See Table 4-25 and Figure 4-23

The 9-pin DB-9 COM1 serial port connector is connected to RS-232 serial communications devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 4-25: RS-232 Serial Port (COM 1) Pinouts

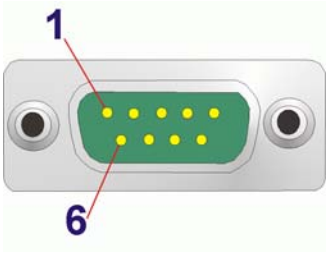

Figure 4-23: COM1 Pinout Locations

4.3.8 VGA Connector

CN Label: VGA1

CN Type: 15-pin Female

CN Location: See Figure 4-18

CN Pinouts: See Figure 4-24 and Table 4-26

This connector is only found on the following models:

- 2801340A
- 2801340B

The 2801340 has a single 15-pin female connector for connectivity to standard display devices.

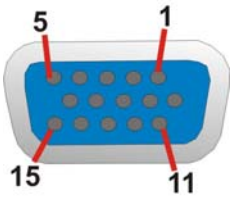

Figure 4-24: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC

PIN	DESCRIPTION	PIN	DESCRIPTION
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 4-26: VGA Connector Pinouts

THIS PAGE IS INTENTIONALLY LEFT BLANK

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the 2801340 may result in permanent damage to the 2801340 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 2801340. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 2801340, 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 2801340, place it on an antic-static pad. This reduces the possibility of ESD damaging the 2801340.
- *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 2801340 is installed. All installation notices pertaining to the installation of the 2801340 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the 2801340 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 2801340, 2801340 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 2801340 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 2801340 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 2801340 off:

- When working with the 2801340, 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 2801340 **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 2801340 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The jumpers have been properly configured
- The 2801340 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - 3907720 daughter board is correctly installed
  - IDE device
  - SATA drives
  - Power supply
  - USB cable
  - Serial port cable
  - PCI expansion card is properly inserted
- The following external peripheral devices are properly connected to the chassis:
  - VGA screen

- Keyboard
- Mouse
- RS-232 serial communications device
- DVI-I or VGA monitor is properly connected
- Parallel communications device

5.3 DIMM Installation

5.3.1 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the 2801340. Please make sure the purchased DIMM complies with the memory specifications of the 2801340 DIMM specifications compliant with the 2801340 are listed in **Chapter 2**.

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

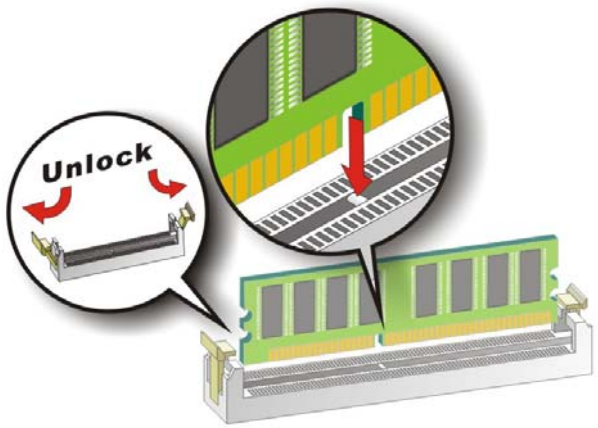

Figure 5-1: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the

socket, the handles must be opened. See **Figure 5-1**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-1**.

Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-1**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.**Step 0:**

5.4 Jumper Settings

NOTE:

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

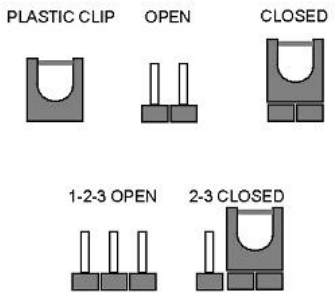

Figure 5-2: Jumper Locations

Before the 2801340 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the 2801340 are listed in **Table 5-1**.

Description	Label	Type
COM2 voltage select	JP1	6-pin header
LCD voltage selection	JP2	3-pin header

RS-232/485 Serial Port Select	JP3	3-pin header
RS-422/485 Serial Port Select	JP4	3-pin header

Table 5-1: Jumpers

5.4.1 Clear CMOS Jumper

Jumper Label: J33

Jumper Type: 3-pin header

Jumper Settings: See Table 5-2

Jumper Location: See Figure 5-3

If the 2801340 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

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

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

After having done one of the above, save the changes and exit the CMOS Setup menu. The clear CMOS jumper settings are shown in **Table 5-2**.

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

Table 5-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-3** below.

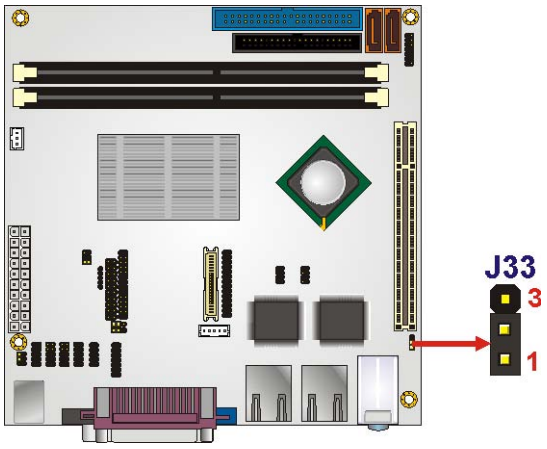

Figure 5-3: Clear CMOS Jumper

5.4.2 COM2 Pin 9 Setting Jumper

Jumper Label:	JP1
Jumper Type:	5-pin header
Jumper Settings:	See Table 5-3
Jumper Location:	See Figure 5-4

The COM 2 Pin 9 Setting jumper configures pin 9 on COM2 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 5-3**.

COM 1 RI Pin	Description	
Short 1 – 2	COM2 RI Pin use +5V	
Short 3 – 3	COM2 RI Pin use +5V	
Short 2 – 4	COM2 RI Pin use +12V	
Short 3 – 5	COM2 RI Pin use +12V	
Short 4 – 6	COM2 RI Pin use RI	Default

Table 5-3: COM2 Pin 9 Setting Jumper Settings

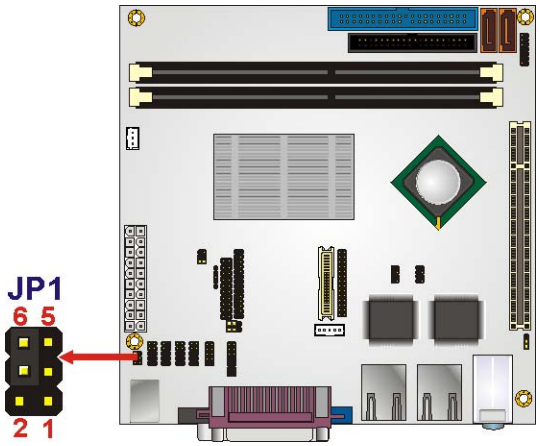

Figure 5-4: COM2 Pin 9 Setting Jumper Location

5.4.3 LCD Voltage Selection

WARNING:

Permanent damage to the screen and 2801340 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: 6-pin header

Jumper Settings: See Table 5-4

Jumper Location: See Figure 5-5

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

AT Power Select	Description	
Short 1-2	+3V	Default
Short 3-4	+5V LVDS	
Short 5-6	+12V	

Table 5-4: LCD Voltage Selection Jumper Settings

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

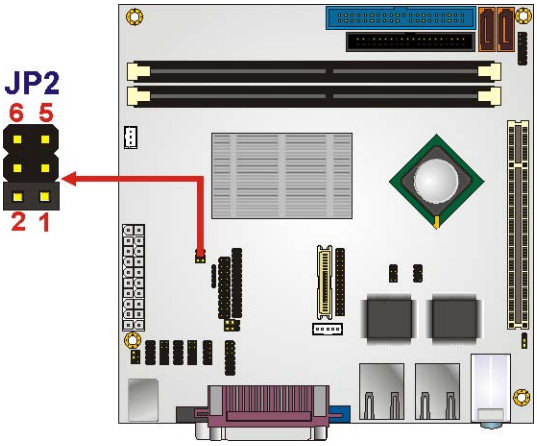

Figure 5-5: LCD Voltage Selection Jumper Location

5.4.4 RS-232/485 Serial Port Select Jumper

Jumper Label: JP3

Jumper Type: 3-pin header

Jumper Settings: See Table 5-5

Jumper Location: See Figure 5-6

The RS-232/485 Serial Port Select jumper sets the communication protocol used by the second serial communications port (COM2) as RS-232 or RS-485. The RS-232/485 Serial Port Select settings are shown in **Table 5-5**.

RS-232/485 Select	Description	
Short 1-2	RS-232	Default
Short 2-3	RS-485	

Table 5-5: RS-232/485 Serial Port Select Jumper Settings

The RS-232/485 Serial Port Select jumper location is shown in **Figure 5-6**.

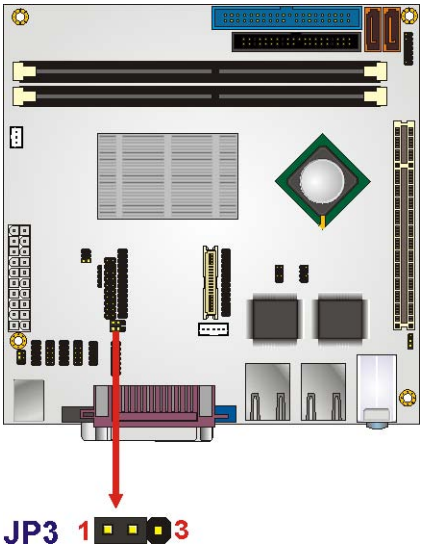

Figure 5-6: RS-232/485 Serial Port Select Jumper Location

5.4.5 RS-422/485 Serial Port Select Jumper

Jumper Label: JP4

Jumper Type: 3-pin header

Jumper Settings: See Table 5-6

Jumper Location: See Figure 5-7

The RS-422/485 Serial Port Select jumper configures the serial port connector as an RS-422 serial port or as an RS-485 serial port. The RS-422/485 Serial Port Select jumper selection options are shown in **Table 5-6**.

AT Power Select	Description	
Short 1 – 2	RS-422	Default
Short 3 – 4	RS-485	

Table 5-6: Serial Port Mode Select Jumper Settings

The RS-422/485 Serial Port Select jumper location is shown in **Figure 5-7** below.

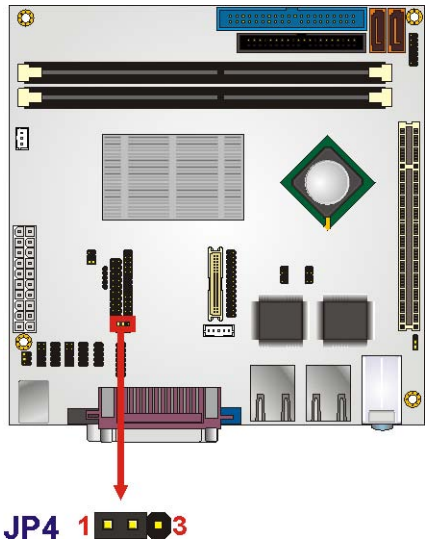

Figure 5-7: Serial Port Mode Select Jumper Pinout Locations

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 2801340 must have air vents to allow cool air to move into the system and hot air to move out.

The 2801340 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.

 NOTE:

Global American, Inc. has a wide range of chassis available at our website www.globalamericaninc.com or call (603) 886-3900.

5.6 Internal Peripheral Device Connections

5.6.1 Peripheral Device Cables

The cables listed in **Table 5-7** are shipped with the 2801340.

Quantity	Type
1	IDE Cable
2	SATA drive cables

1	SATA drive power cable
1	Dual RS-232 cable
1	DVI-to-VGA adapter cable

Table 5-7: Global American Provided Cables

Optional cables are listed below:

- 3907720 LVDS Daughter board
- 1207793 Dual USB cable
- 1208470 ATA/33 44p/44p Flat cable

5.6.2 IDE Cable Connection

NOTE:

The instructions are valid for both the 40-pin ATA66/100 flat cable (IDE-Cable Provided with Package Contents) and the optional 44-pin ATA33 44p/44p flat cable (P/N: 1208470)

The IDE flat cable connects to the 2801340 to one or two IDE devices. To connect an IDE HDD to the 2801340, please follow the instructions below.

Step 1: **Locate the IDE connector**. The location 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 5-8**. A key on the front of the cable connector ensures it can only be inserted in one direction.

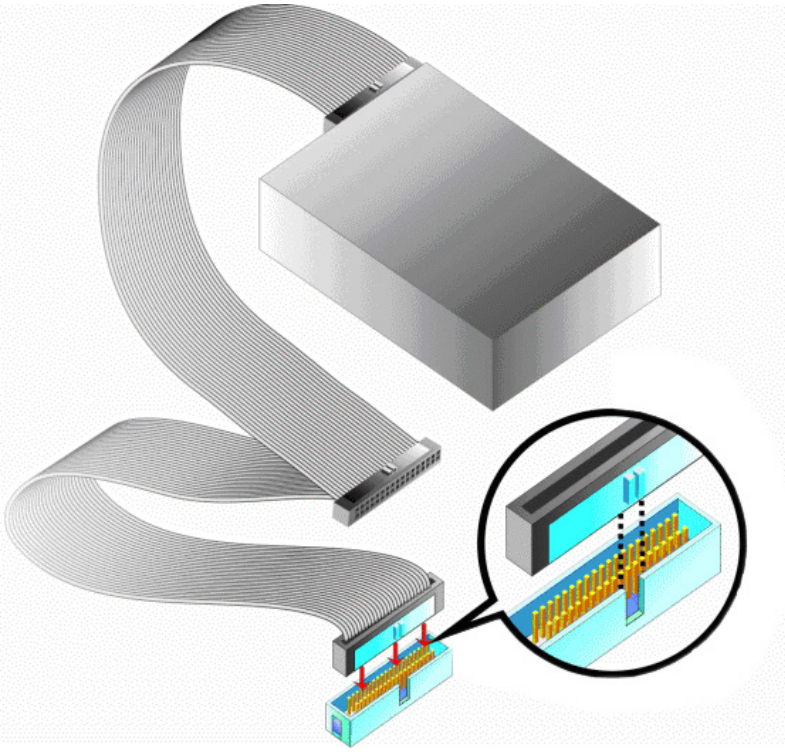

Figure 5-8: IDE Cable Connection

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 Dual RS-232 Cable with Slot Bracket

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

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

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-9**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

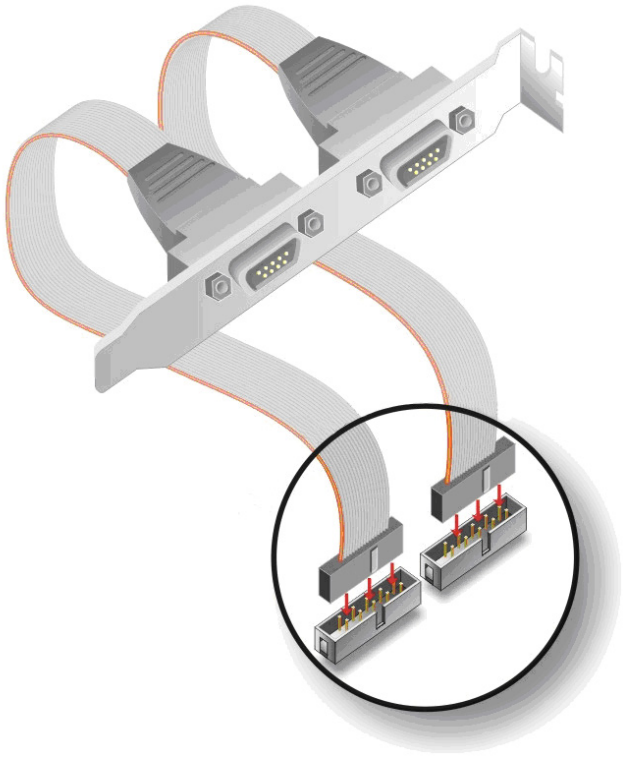

Figure 5-9: Dual RS-232 Cable Installation

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

5.6.4 SATA Drive Connection

The 2801340 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

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

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

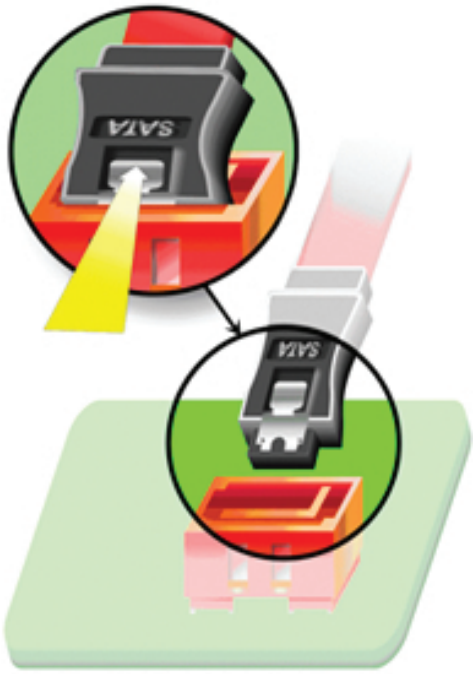

Figure 5-10: SATA Drive Cable Connection

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

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

Figure 5-11: SATA Power Drive Connection

5.6.5 USB Cable (Dual Port) with Slot Bracket

The 2801340 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

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

WARNING:

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

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the 2801340 USB connector.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the 2801340, connect the cable connectors to the onboard connectors. See **Figure 5-12**.

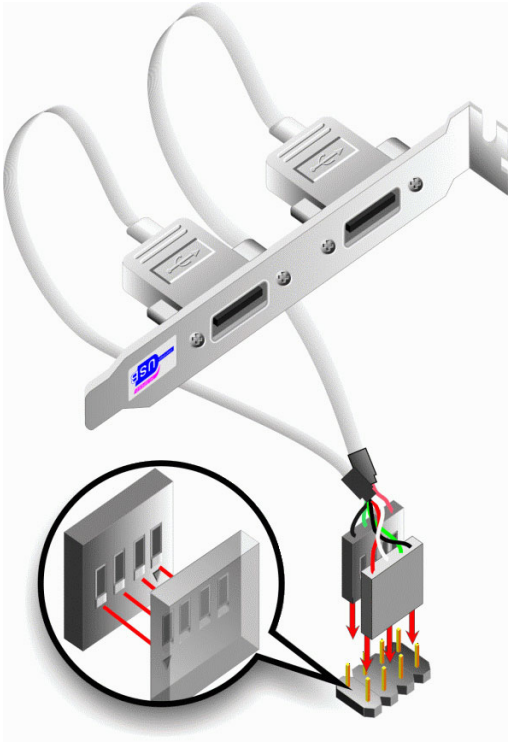

Figure 5-12: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation.

5.6.6 Optional 3907720 Daughter Board Installation WARNING:

WARNING:

Installing the 3907720 daughter board incorrectly may cause irreparable damage to the LVDS display and the 2801340.

The 3907720 daughter board supports 18-bit and 24-bit LVDS devices. The 3907720 daughter board is installed on the J6 and J8 connectors. 18-bit and 24-bit installation is as follows:

- ***18-bit LVDS connectivity***: Pin 27 and Pin 28 on J6 and J8 must be left uncovered.
- ***24-bit LVDS connectivity***: Pin 1 and Pin 2 on J6 and J8 must be left uncovered.

For further details see below.

5.6.6.1 18-bit LVDS Connectivity

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

Step 1: **Correctly orientate the 3907720 daughter board**. The VIA chipset on the 3907720 daughter board should be on the side of the 3907720 facing the EPIC connectors.

Step 2: **Correctly align the pins**. Align the connectors on the bottom of the 3907720 with pins 1 – pins 26 on the J6 and J8 connectors.

Step 3: **Install the 3907720 onto the connectors**. Pin 27 and pin 28 on both the J6 and J8 connector should be visible. See **Figure 5-13**.

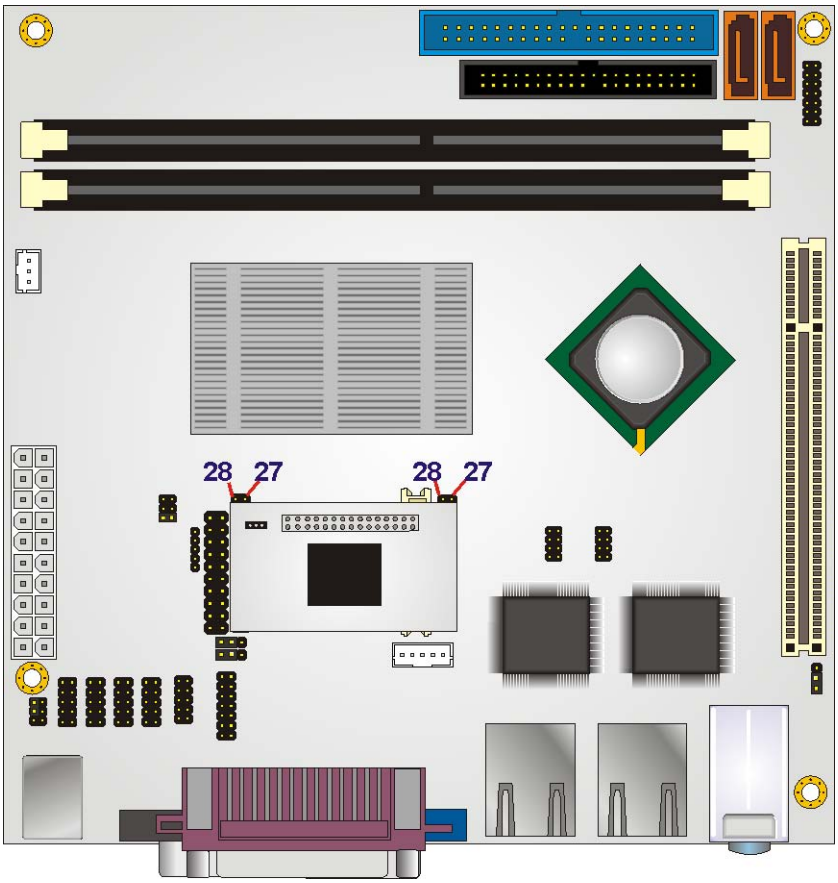

Figure 5-13: 18-bit LVDS 3907720 Connectivity

5.6.6.2 24-bit LVDS Connectivity

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

Step 1: **Correctly orientate the 3907720 daughter board**. The VIA chipset on the 3907720 daughter board should be on the side of the 3907720 facing the EPIC connectors.

Step 2: **Correctly align the pins**. Align the connectors on the bottom of the 3907720 with pins 1 – pins 26 on the J6 and J8 connectors.

Step 3: **Install the 3907720 onto the connectors**. Pin 1 and pin 2 on both the J6 and J8 connector should be visible.See **Figure 5-14**.

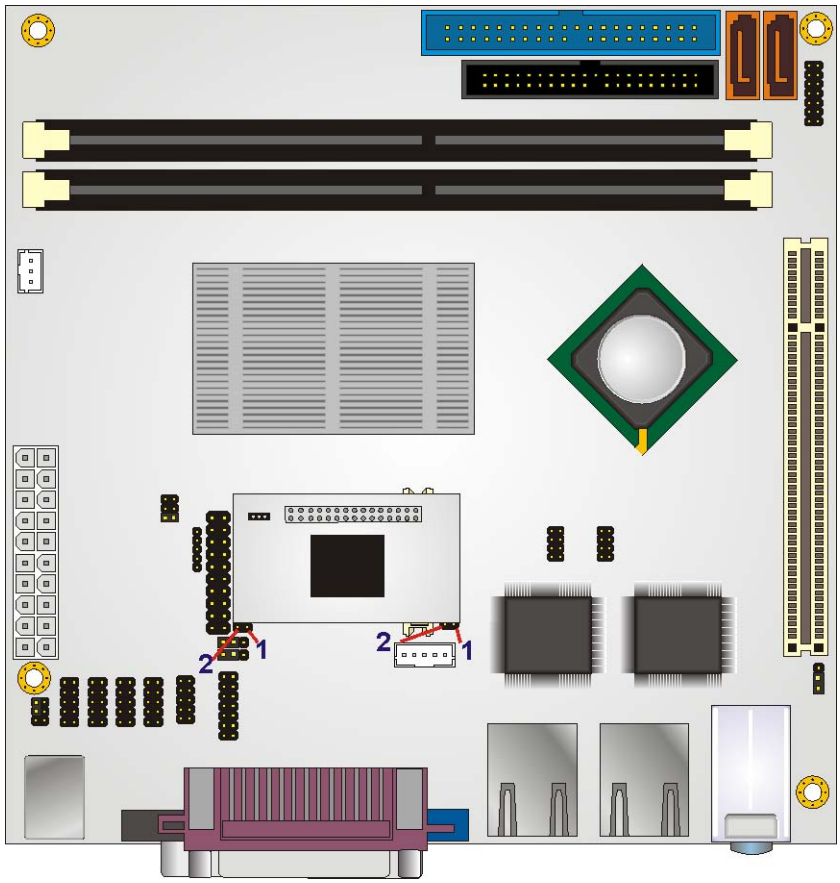

Figure 5-14: 24-bit LVDS 3907720 Connectivity

5.7 External Peripheral Interface Connection

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

- RJ-45 Ethernet cable connectors
- S-video display device
- USB device
- VGA monitor

To install these devices, connect the corresponding cable connector from the actual device to the corresponding 2801340 external peripheral interface connector making sure the pins are properly aligned.

5.7.1 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the 2801340.

Step 1: **Locate the audio phone jacks**. The location of the audio phone jacks are shown in **Chapter 3**.

Step 2: **Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See Figure 5-15.

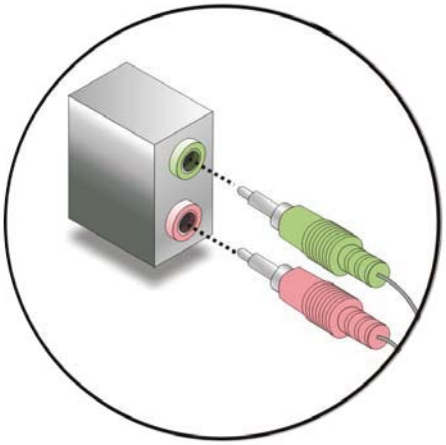

Figure 5-15: Audio Connectors

5.7.2 DVI Display Device Connection

This connector is only found on the following models:

- 2801340C
- 2801340D

The 2801340 has a single female DVI-I connector on the external peripheral interface panel. The DVI-I connector is connected to a digital display device. To connect a digital display device to the 2801340, please follow the instructions below.

Step 1: **Locate the DVI-I connector**. The location of the DVI-I connector is shown in **Chapter 2**.

Step 2: **Align the DVI-I connector**. Align the male DVI-I connector on the digital display device cable with the female DVI-I connector on the external peripheral interface.

Step 3: **Insert the DVI-I connector** Once the connectors are properly aligned with the male connector, insert the male connector from the digital display device into the female connector on the 2801340. See **Figure 5-16**.

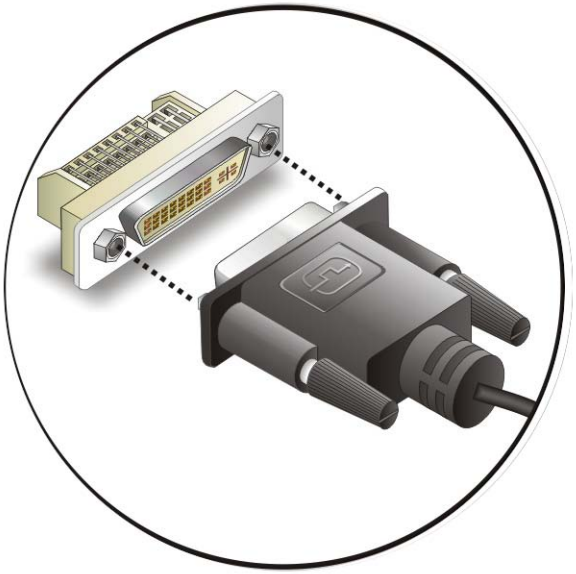

Figure 5-16: DVI Connector

Step 4: **Secure the connector.** Secure the DVI-I connector from the digital display device to the external interface by tightening the two retention screws on either side of the connector.

5.7.3 LAN Connection

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

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

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the 2801340.

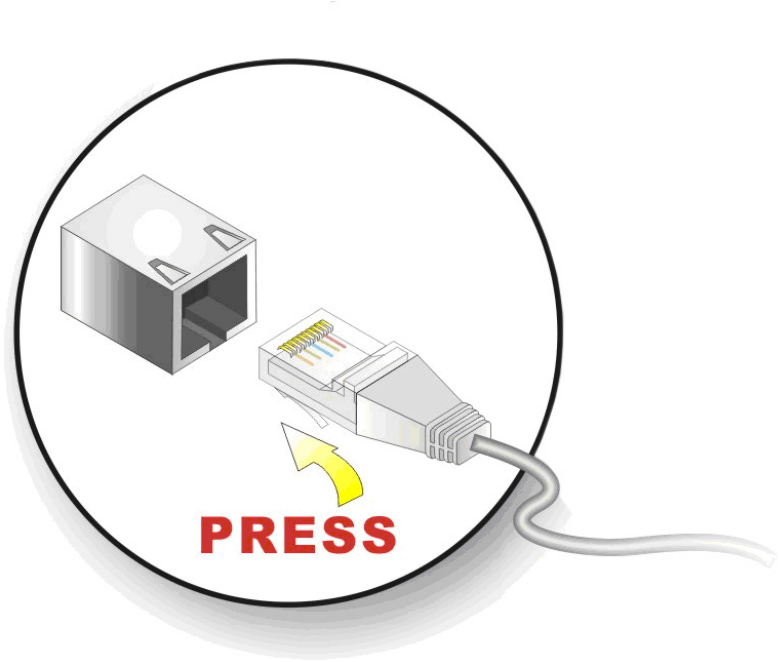

Figure 5-17: LAN Connection

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

5.7.4 Parallel Device Connection

The 2801340 has a single female DB-25 connector on the external peripheral interface panel for parallel devices. Follow the steps below to connect a parallel device to the 2801340.

Step 1: **Locate the DB-25 connector**. The location of the DB-25 connector is shown in **Chapter 3**.

Step 2: **Insert the DB-25 connector**. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See Figure 5-18.

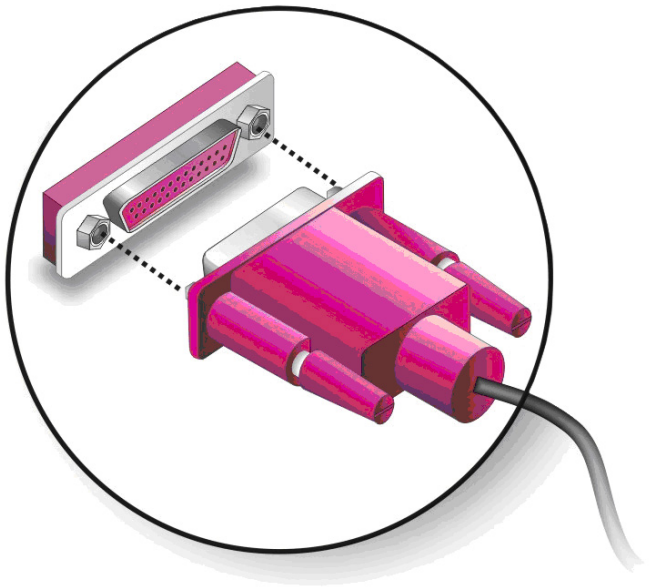

Figure 5-18: Parallel Device Connector

Step 3: **Secure the connector**. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

5.7.5 PS/2 Keyboard and Mouse Connection

The 2801340 has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the 2801340.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See Figure 5-19.

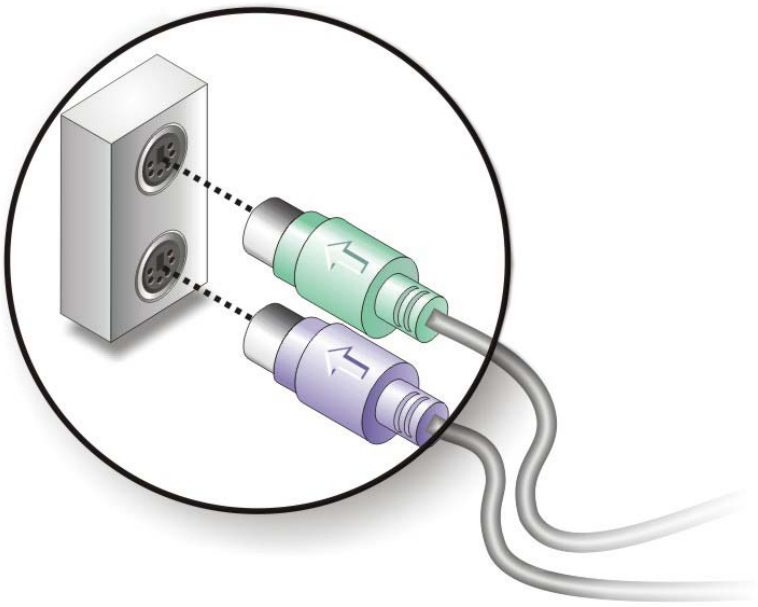

Figure 5-19: PS/2 Keyboard/Mouse Connector

5.7.6 Serial Device Connection

The 2801340 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the 2801340.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 5-20.

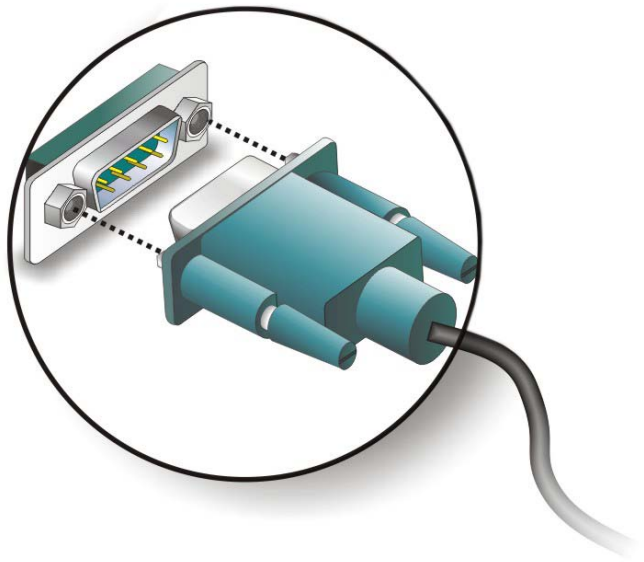

Figure 5-20: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

5.7.7 USB Connection

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the 2801340.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See Figure 5-21.

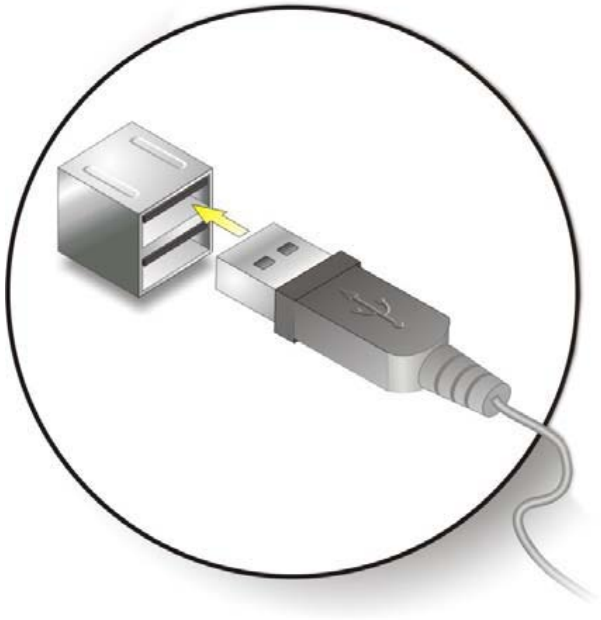

Figure 5-21: USB Connector

5.7.8 VGA Monitor Connection

This connector is only found on the following models:

- 2801340A and 2801340C (Embedded VIA Luke 533 Processor)
- 2801340D and 2801340E (Embedded VIA Luke 1.0 GHz Processor)

The 2801340 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the 2801340, please follow the instructions below.

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

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

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the

insert the male connector from the VGA screen into the female connector on the 2801340.

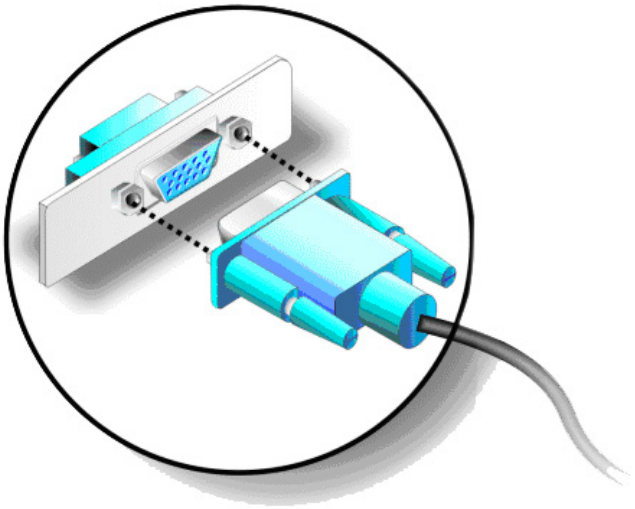

Figure 5-22: VGA Connector

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

THIS PAGE IS INTENTIONALLY LEFT BLANK

Appendix

B

DIO Interface

B.1 DIO Interface Introduction

The GPIO connector on the 2801340 is interfaced to GPIO ports on the Super I/O chipset. The GPIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

NOTE:

For further information, please refer to the datasheet for the Winbond Super I/O chipset.

B.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	GP0	128 (GP0)	General purpose I/O port 1 bit 0
4	GP1	127 (GP1)	General purpose I/O port 1 bit 1
5	GP2	126 (GP2)	General purpose I/O port 1 bit 2
6	GP3	125 (GP3)	General purpose I/O port 1 bit 3
7	GP4	124 (GP4)	General purpose I/O port 1 bit 4
8	GP5	123 (GP5)	General purpose I/O port 1 bit 5
9	GP6	122 (GP6)	General purpose I/O port 1 bit 6
10	GP7	121 (GP7)	General purpose I/O port 1 bit 7

B.3 Assembly Language Samples

B.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

```
MOV     AX, 6F08H     Sets the digital port as input
INT     15H           Initiates the INT 15H BIOS call
```

B.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

```
MOV     AX, 6F09H     Sets the digital port as output
MOV     BL, 09H
INT     15H           Initiates the INT 15H BIOS call
```

Appendix

C

Watchdog Timer

NOTE:

The following discussion applies to DOS environment. Contact Global American for specific drivers or 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

D

Address Mapping

D.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	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 D-1: IO Address Map

D.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 D-2: 1st MB Memory Address Map

D.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 D-3: IRQ Mapping Table

D.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 D-4: IRQ Mapping Table

THIS PAGE IS INTENTIONALLY LEFT BLANK

Appendix

E

VIA® RAID for SATA

E.1 Introduction

The VIA SATA RAID can control serial ATA (SATA) disks. VIA RAID is cost-effective RAID functionality that can increase the data read/write speed and provide protection to data by distributing mirrored duplicates of data onto two disk drives (RAID 1).

CAUTION!

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

E.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

WARNING!

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

CAUTION!

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

E.2 Features and Benefits

- Supports RAID levels 0, 1, and JBOD
- Supports connectivity to two disk drives
- Supported Operating Systems include: Windows 98/Me, Windows 2000 and Windows XP
- Windows-based software for RAID management

E.3 Installing the RAID Controller

To install the RAID controller using Windows or a later OS, please follow the steps below.

Step 1: **Connect SATA drives to the system**. Connect two SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

NOTE:

Make sure the SATA drives are **EXACTLY** the same when they are configured in a RAID configuration (JBOD, RAID 0 or RAID 1). If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

Step 2: Make sure the target system is already installed on the floppy drive.

Step 3: Prepare a blank floppy disk.

Step 4: Copy all files under \DRVDISK from the driver CD to the floppy disk.

Step 5: Power on the target machine and boot from the Boot CD.

Step 6: Press “F6” when the prompt appears on the bottom line.

Step 7: When a request appears asking for the floppy disk to be inserted, insert the prepared floppy disk into the floppy drive and press **ENTER**

Step 8: Select the correct items for the OS and RAID controller being installed. Each item shows the matching OS.

E.4 RAID Tool Access

To understand how to use the RAID tool please access the RAID HTML help file from the CD drive that came with the system. Insert the CD into the system and access the “**raid_tool.html**” file from following directory:

- [CD Drive]:\5-SATA RAID\VIA_RAID_V530C\RaidTool\Utility

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