



integration with integrity

2808130 User's Manual
Mini-ITX ATom Board
Version 1.0

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Packing List

The items listed below should all be included in the 2808130 package.

- 1 x 2808130 Mini-ITX Motherboard
- 1 x Dual RS-232 cable (P/N: 32200-028401-RS)
- 2 x SATA cable (P/N: 32000-062800-RS)
- 1 x I/O shielding (P/N: 45014-0008C0-00-RS)
- 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**.

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Chapter

1

Introduction

1.1 Introduction



Figure 1-1: 2808130

The 2808130 Mini-ITX motherboards are embedded 45 nm Intel® Atom™ processor platforms. The embedded Intel® Atom™ N270 processor has a 1.60 GHz clock speed, a 533 MHz FSB and a 512 KB L2 cache. The 2808130 also supports one 200-pin 533 MHz 2.0 GB (max.) DDR2 SDRAM SO-DIMM. The board comes with VGA, DVI, HDTV and 18-bit dual-channel LVDS video outputs. The 2808130 also comes with two PCI Express (PCIe) Gigabit Ethernet (GbE) connectors, onboard AC'97 audio, three RS-232 serial ports, one RS-232/422/485 serial port, a CompactFlash® slot, six USB 2.0 ports, IDE connector and PCI expansion card slot.

1.2 2808130 Overview

1.2.1 Overview Photo

The 2808130 has a wide variety of peripheral interface connectors.

Figure 1-2 is a

labeled photo of the peripheral interface connectors on the 2808130.

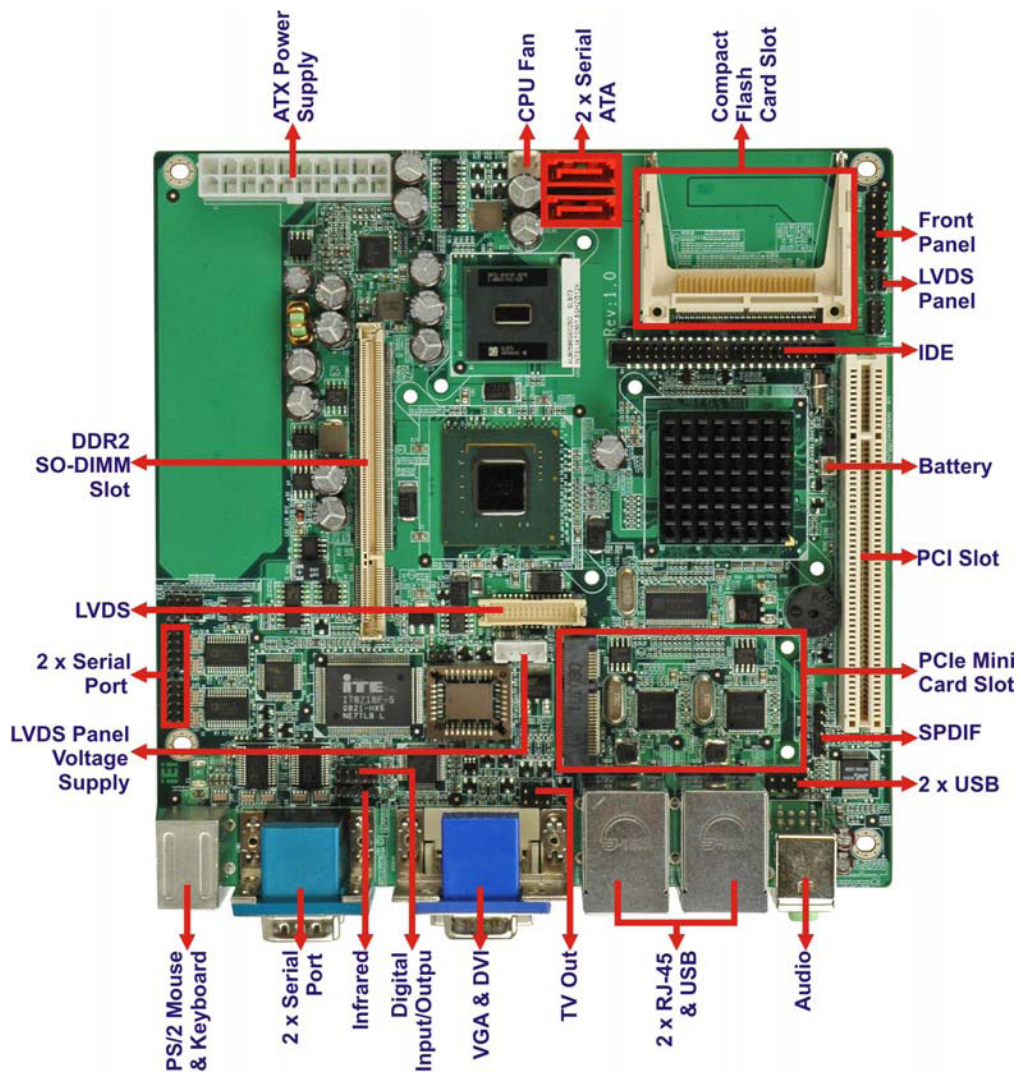


Figure 1-2: 2808130 Overview

1.2.2 Peripheral Connectors and Jumpers

The 2808130 has the following connectors on-board:

- 1 x ATX power connector
- 1 x Battery connector
- 1 x CompactFlash® slot
- 1 x DDR2 SO-DIMM memory socket
- 1 x Digital I/O connector
- 1 x Fan connector

-
- 1 x Front panel connector
 - 1 x IDE connector (44-pin)
 - 1 x Infrared connector
 - 1 x LCD backlight inverter connector
 - 1 x LVDS connector
 - 1 x PCIe Mini slot
 - 2 x RS-232 connectors
 - 1 x RS-422/485 connector
 - 2 x SATA connectors
 - 1 x TV output connector
 - 1 x USB 2.0 connector (2 ports)

The 2808130 has the following external peripheral interface connectors on the board rear panel.

- 1 x Audio stereo output
- 1 x DVI
- 2 x LAN
- 1 x Microphone input
- 1 x PS/2 keyboard connector
- 1 x PS/2 mouse connector
- 2 x RS-232 serial ports
- 4 x USB 2.0
- 1 x VGA

The 2808130 has the following on-board jumpers:

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

1.2.3 Technical Specifications

2808130 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	2808130
Form Factor	Mini-ITX
System CPU	45 nm 1.60 GHz Intel® Atom™ N270
Front Side Bus (FSB)	533 MHz
System Chipset	Northbridge: Intel® 945GSE Southbridge: Intel® ICH7M
Memory	One 200-pin SO-DIMM socket supports one 533 MHz 2.0 GB (max.) DDR2 SDRAM SO-DIMM
CompactFlash®	One CompactFlash® socket
Super I/O	iTE IT8718F
Display	VGA DVI (through Silicon Image Sil1362) LVDS HDTV
BIOS	AMI BIOS label
Audio	Realtek ALC655 AC'97 codec
LAN	Two Realtek RTL8111C PCIe GbE controllers
COM	Two RS-232 serial ports (one internal, one external) One RS-232/422/485 serial port (internal)
USB2.0	Six USB 2.0 devices supported (two internal, four external)
Hard Drives	One 44-pin IDE connector
SATA	Two 3.0 Gb/s SATA drives supported
Keyboard/mouse	Two external PS/2 connectors
Digital I/O	One 8-bit digital input/output connector; 4-bit input/4-bit output through the iTE IT8718F super I/O
Watchdog Timer	Software programmable 1-255 sec. through the iTE IT8718F super I/O

Specification	2808130
Infrared	One infrared connector supports Serial Infrared (SIR) Amplitude Shift Keyed IR (ASKIR)
Power Supply	ATX and AT power supported
Power Consumption	5 V @ 2.89 A 12 V @ 0.04 A (with 2.0 GB DDR2 memory)
Temperature	0°C – 60°C (32°F - 140°F)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	170 mm x 170 mm
Weight (GW/NW)	1100 g / 370 g

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Dimensions

2.1.1 Board Dimensions

The dimensions of the board are listed below:

- Length: 170 mm
- Width: 170 mm

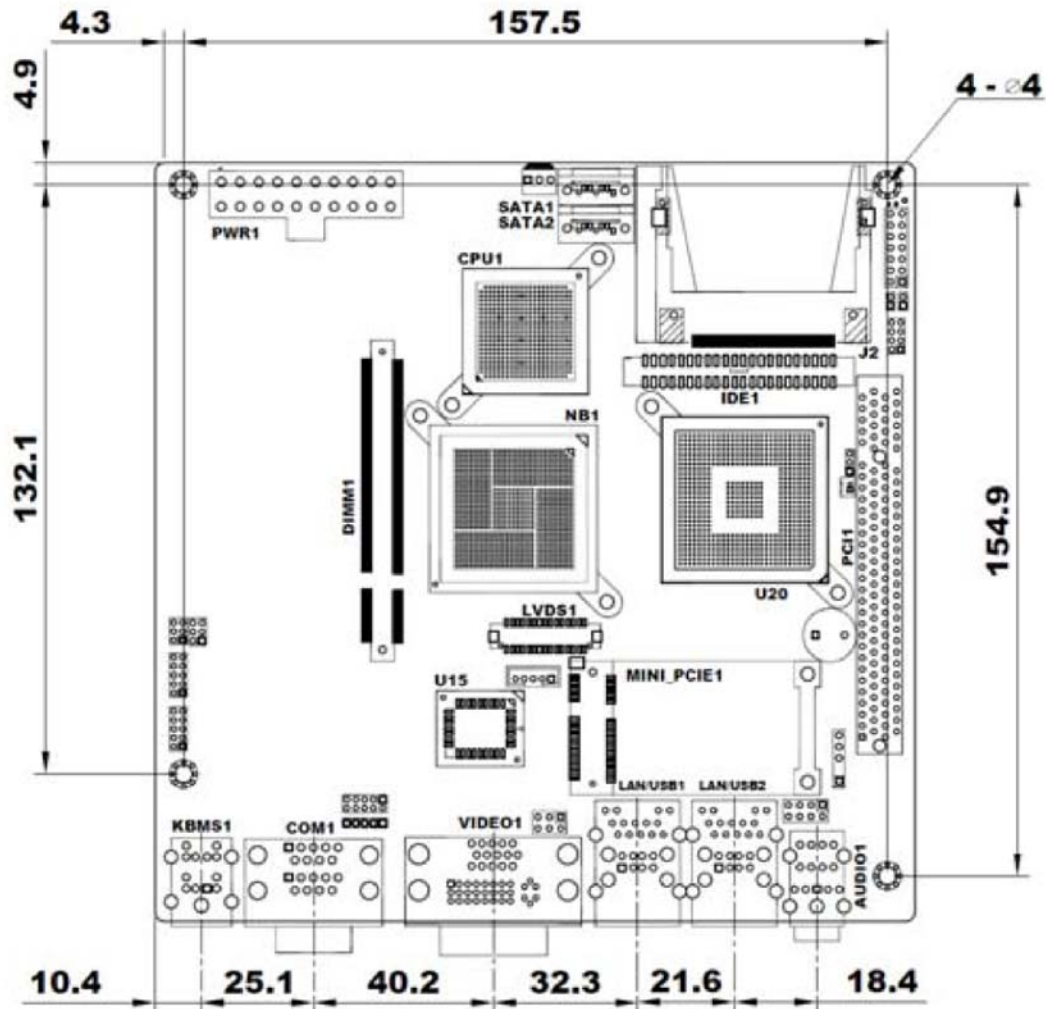


Figure 2-1: 2808130 Dimensions (mm)

2.1.2 External Interface Panel Dimensions

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

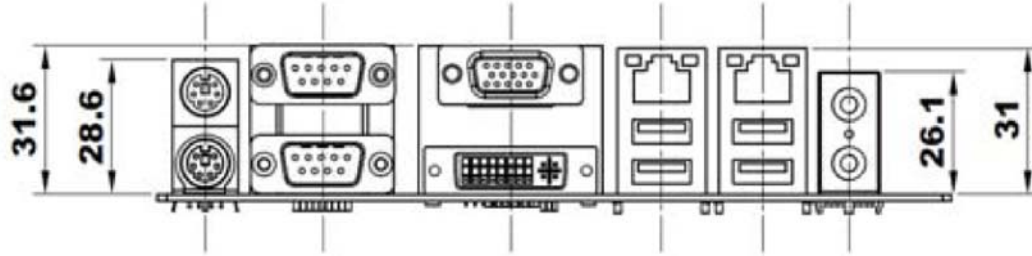


Figure 2-2: External Interface Panel Dimensions (mm)

2.2 Data Flow

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

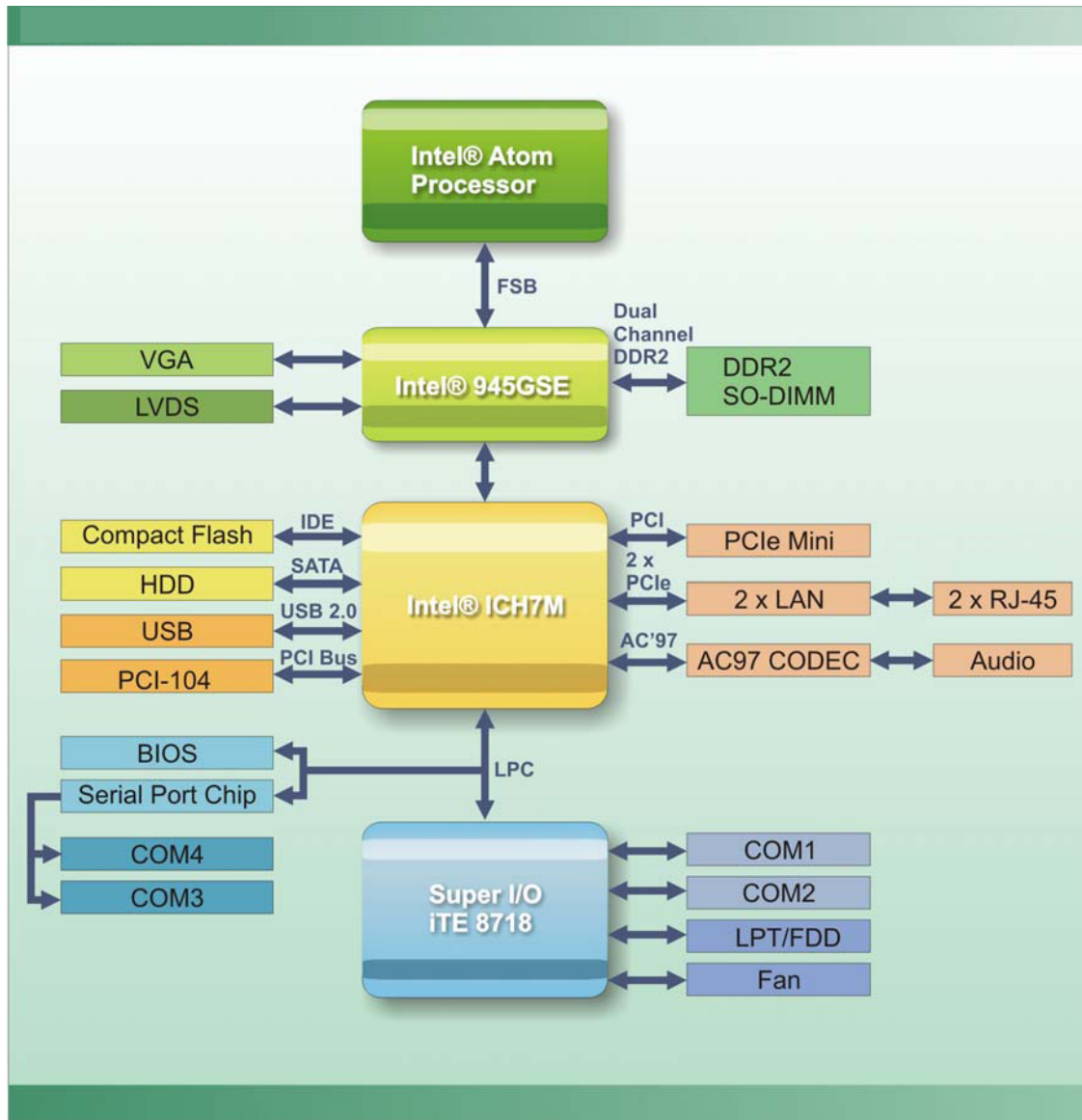


Figure 2-3: Data Flow Block Diagram

2.3 Embedded Intel® Atom™ Processor

2.3.1 Overview

The 2808130 comes with an embedded 45 nm 1.60 GHz Intel® Atom™ N270 processor. The processor supports a 533 MHz FSB and has a 512 KB L2 cache. The low power processor has a maximum power of 2.5 W. The processor is shown in **Figure 2-4** below.

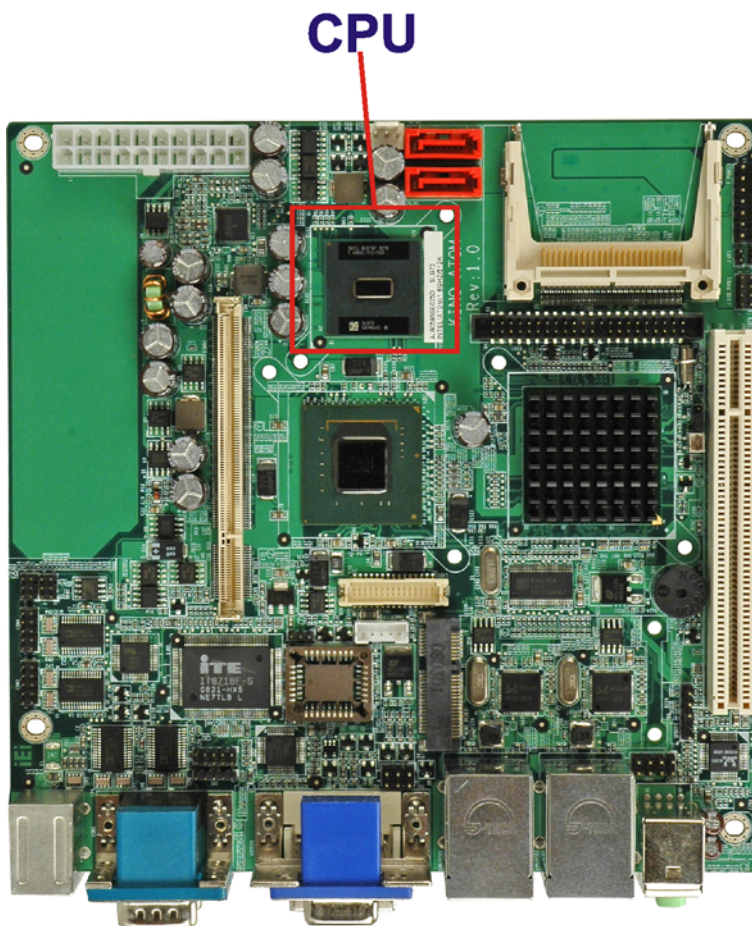


Figure 2-4: Intel® Atom™ N270 CPU

2.3.2 Features

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

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

2.3.3 Front Side Bus (FSB)

The Intel® Atom™ processor on the 2808130 is interfaced to the Intel® 945GSE Northbridge through a 533 MHz front side bus (FSB). The FSB is shown in **Figure 2-5** below.

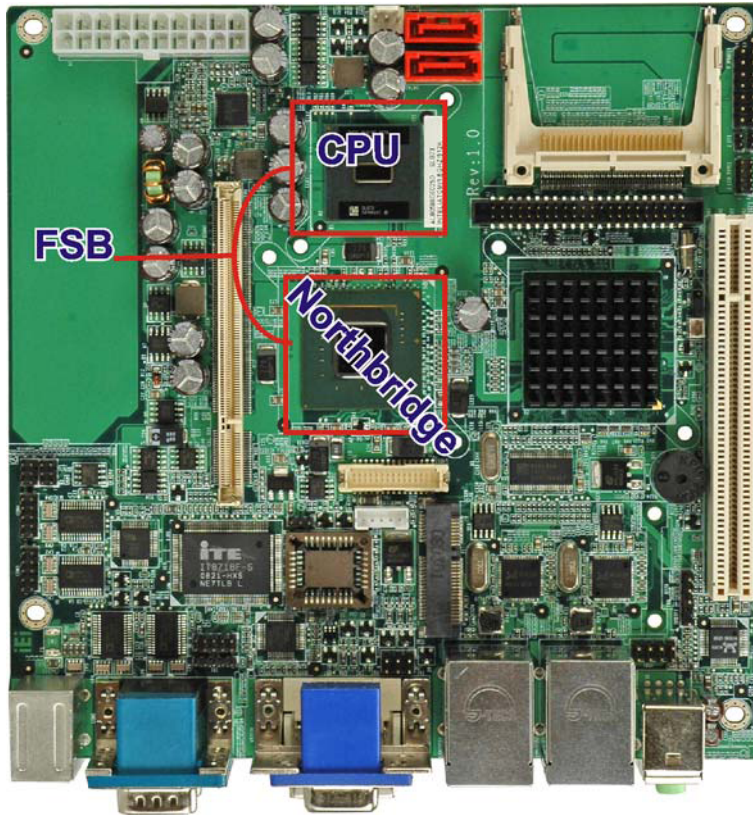


Figure 2-5: Front Side Bus

2.4 Intel® 945GSE Northbridge Chip

The Intel® 945GSE Graphics and Memory Controller Hub (GMCH) supports the embedded Intel® Atom™ N270 processor. The Intel® 945GSE is interfaced to the processor through a 533 MHz FSB.

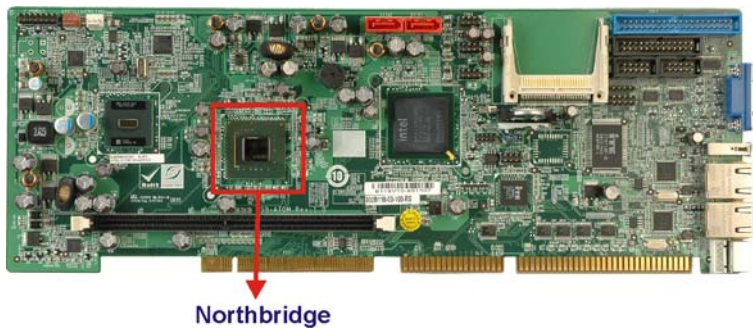


Figure 2-6: Intel® 945GSE Northbridge Chip

2.4.1 DDR2 Controller

There is one 200-pin DDR2 SO-DIMM socket on the 2808130. The socket supports DDR2 SO-DIMM with the following specifications:

- Maximum Memory supported 2 GB (1 GB per rank)
- Support for DDR2 at 400 MHz and 533 MHz
- No support for Dual-Channel Interleaved mode of operation
- Enhanced Addressing support (Swap only)

The SO-DIMM socket is shown in **Figure 2-7** below.

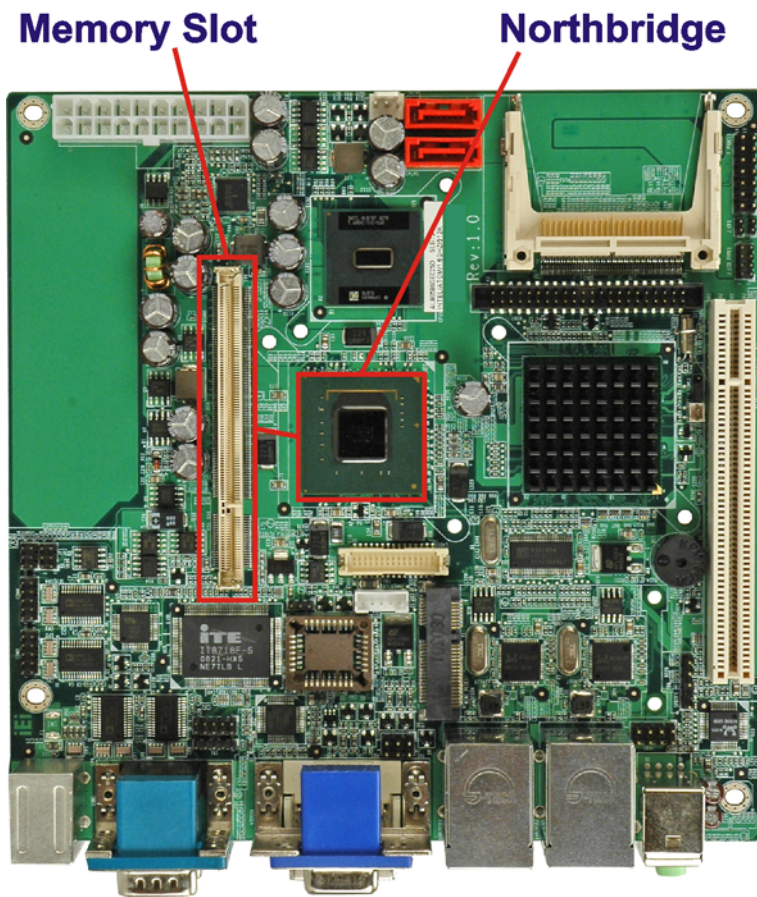


Figure 2-7: DDR2 SO-DIMM Socket

2.4.2 Graphics

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

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

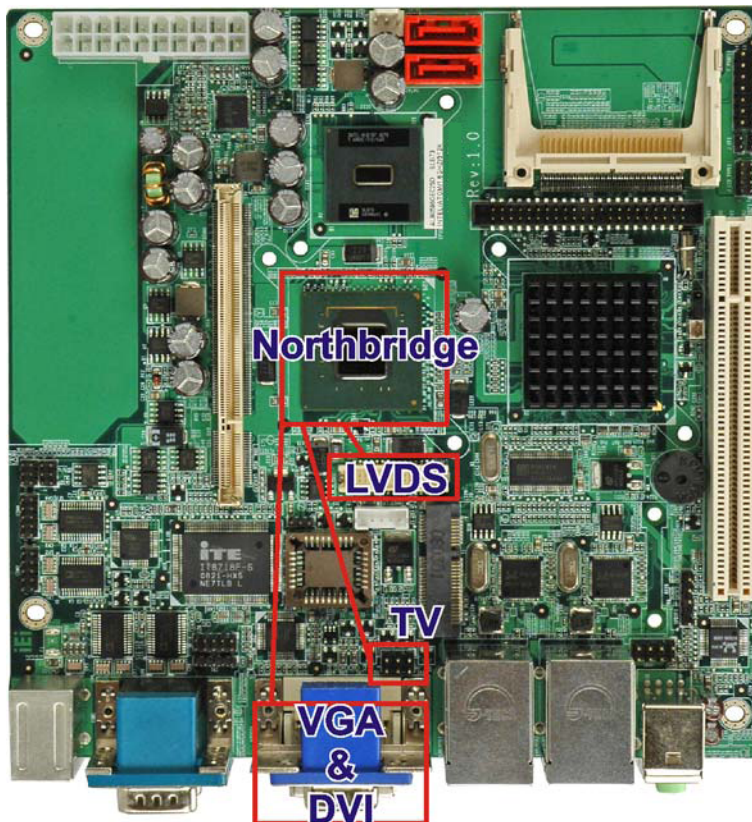


Figure 2-8: Graphics

2.4.2.1 Analog CRT (VGA)

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

2.4.2.2 LVDS

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

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

2.4.2.3 TV Out

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

- Three integrated 10-bit DACs
- Macrovision support
- Overscaling
- NTSC and PAL formats supported
- Supports RCA or S-VIDEO connectivity
- Supports HDTV with the following resolutions:
 - 480p
 - 720p
 - 1080i
 - 1080p

2.4.2.4 SDVO and DVI

The SDVO is connected to the DVI output through the Silicon Image Sil1362. The Intel® 945GSE internal graphics engine has the following SDVO output features:

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

- Display hot plug support

2.5 Intel® ICH7M Southbridge Chipset

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

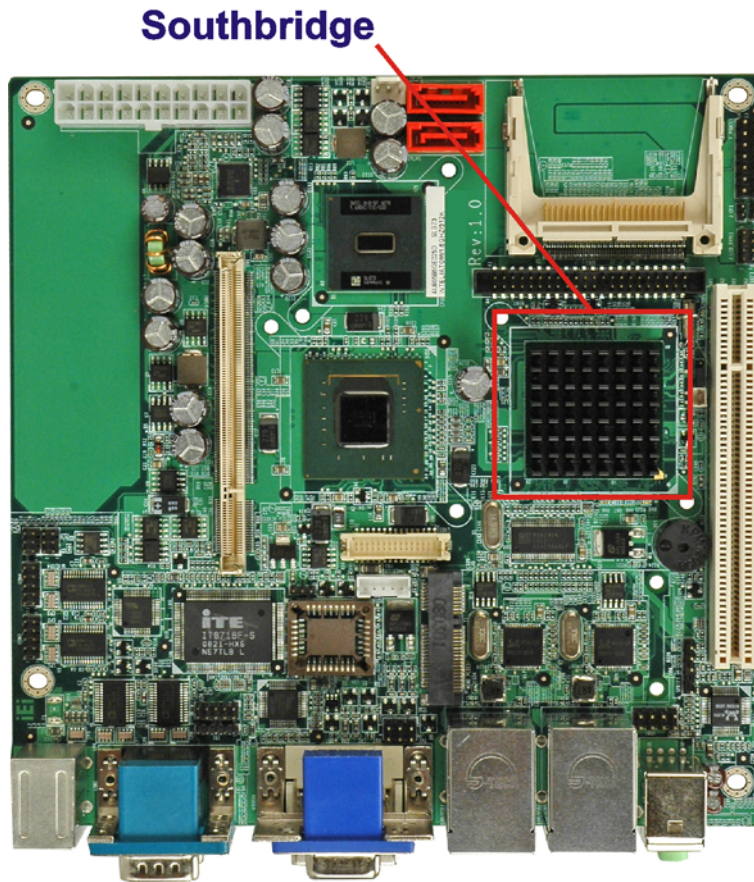


Figure 2-9: Intel® ICH7M Southbridge Chipset

- Complies with PCI Express Base Specification, Revision 1.0a
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33 MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
 - Enhanced DMA controller
 - Interrupt controller

-
- Timer functions
 - Integrated SATA host controller with DMA operations interfaced to two SATA connectors on the 2808130
 - Integrated IDE controller supports Ultra ATA 100/66/33
 - Supports the four USB 2.0 devices on the 2808130 with four UHCI controllers and one EHCI controller
 - Complies with System Management Bus (SMBus) Specification, Version 2.0
 - Supports Audio Codec '97 (AC'97) Revision 2.3
 - Supports Intel® High Definition Audio
 - Contains Low Pin Count (LPC) interface
 - Supports Firmware Hub (FWH) interface
 - Serial peripheral interface support

2.5.1 Audio Codec '97 Controller

The Audio Codec '97 (AC'97) controller integrated into the Intel® ICH7M complies with AC'97 Component Specification, Version 2.3. The AC'97 controller is connected to the following audio jacks on the external connector panel.

- Stereo output
- Microphone input

2.5.2 IDE Interface

The IDE interface connects with

- 2.5.2.1 IDE Connector 18
- 2.5.2.2 CompactFlash® Slot 20

2.5.2.1 IDE Connector

The IDE connector on the Intel® ICH7M Southbridge connects to an IDE hard disk or other IDE device. The IDE connector is shown in **Figure 2-10** below.

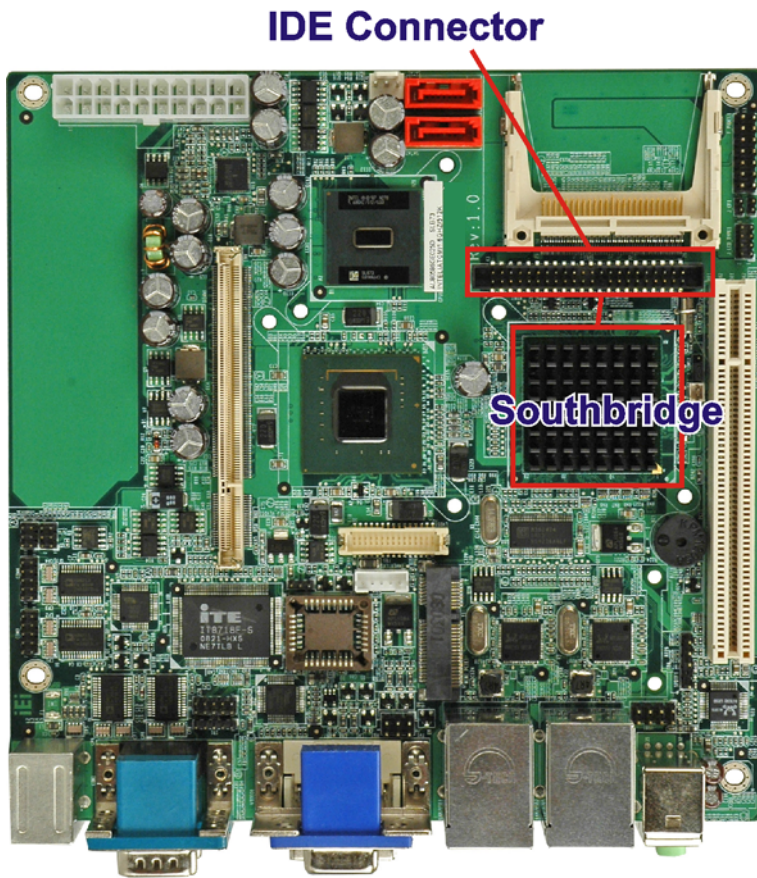


Figure 2-10: IDE Connector

PIO IDE transfers up to 16 MB/s and Ultra ATA transfers of 100 MB/s. The integrated IDE interface is able to support the following IDE HDDs:

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

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

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/33
Controller Interface	5 V	5 V	5 V

Table 2-1: Supported HDD Specifications

2.5.2.2 CompactFlash® Slot

The CompactFlash® slot on the 2808130 is interfaced through the IDE interface on the Intel® ICH7M Southbridge. The CompactFlash® slot is shown in **Figure 2-10** below.

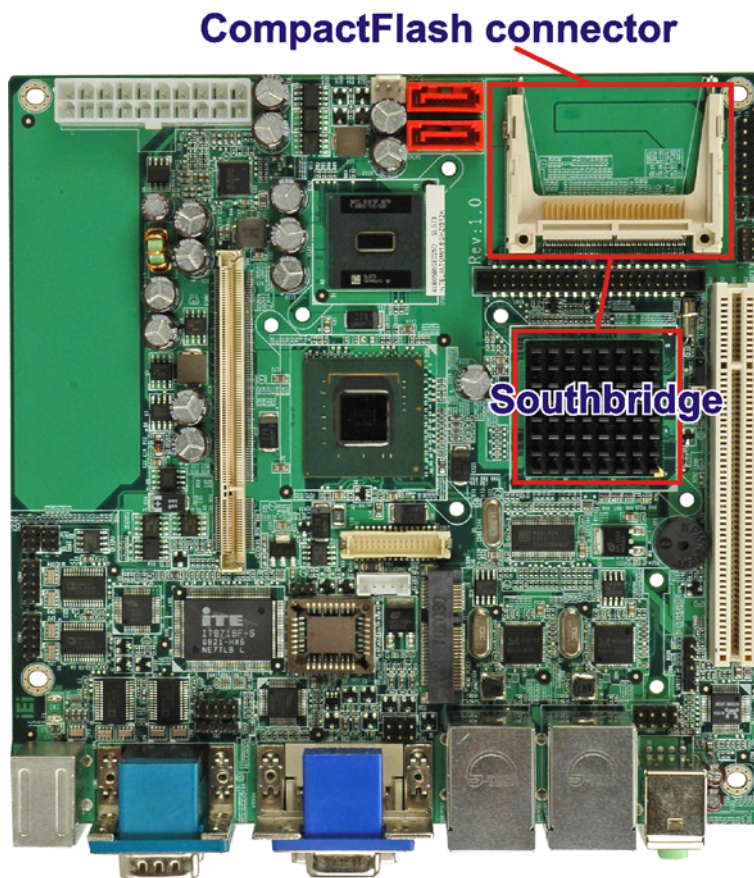


Figure 2-11: CompactFlash® Slot

2.5.3 Low Pin Count (LPC) Interface

The Intel® ICH7M LPC interface complies with the LPC 1.1 specifications. The LPC bus from the Intel® ICH7M is connected to the following components:

- BIOS chipset
- Super I/O chipset

2.5.4 PCI Bus

The PCI interface on the Intel® ICH7M 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
- 33 MHz
- 5 V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

2.5.4.1 PCI Expansion Card Slot

The PCI interface is connected directly to the PCI expansion card slot on the 2808130. The location of the PCI expansion card slot is shown in Figure 2-12 below.

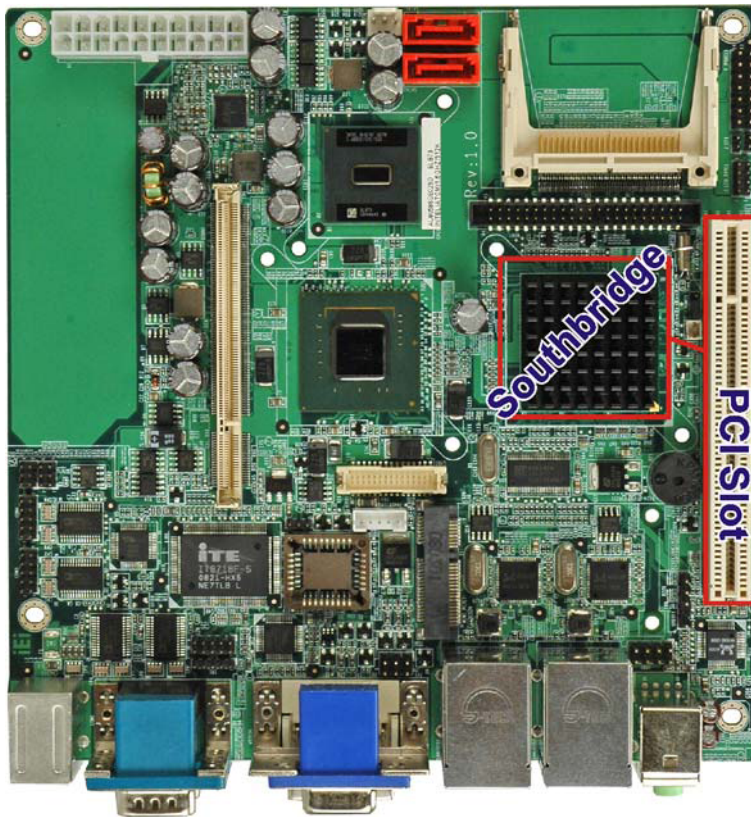


Figure 2-12: PCI Edge Connector

2.5.5 PCIe Bus

The Intel® ICH7M Southbridge chipset has four PCIe lanes. Two of the four PCIe lanes are interfaced to PCIe GbE controllers. Another lane is connected to the PCIe Mini card slot.

2.5.5.1 PCIe GbE Ethernet

Two PCIe lanes are connected to two Realtek RTL8111C PCIe GbE controllers shown in Figure 2-13 below.

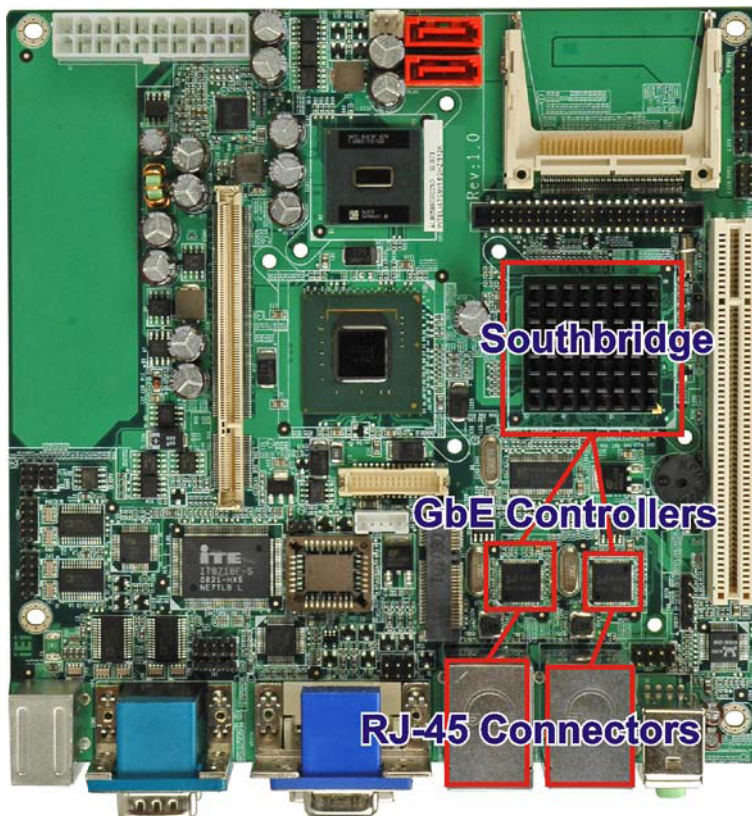


Figure 2-13: Realtek PCI GbE Controllers

The Realtek RTL8111C PCIe GbE controllers combine a triple-speed IEEE 802.3 compliant Media Access Controller (MAC) with a triple-speed Ethernet transceiver, 32-bit PCIe bus controller, and embedded memory. With state-of-the-art DSP technology and mixed-mode signal technology, they offer high-speed transmission over CAT 5 UTP cable or CAT 3 UTP (10 Mb/s only) cable. Functions such as Crossover Detection & Auto-Correction, polarity correction, adaptive equalization, cross-talk cancellation, echo

cancellation, timing recovery, and error correction are implemented to provide robust transmission and reception capability at high speeds.

Some of the features of the Realtek RTL8111C PCIe GbE controllers are listed below.

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

2.5.5.2 PCIe Mini Card

One PCIe lane is connected to a PCIe Mini card slot shown in Figure 2-14 below.

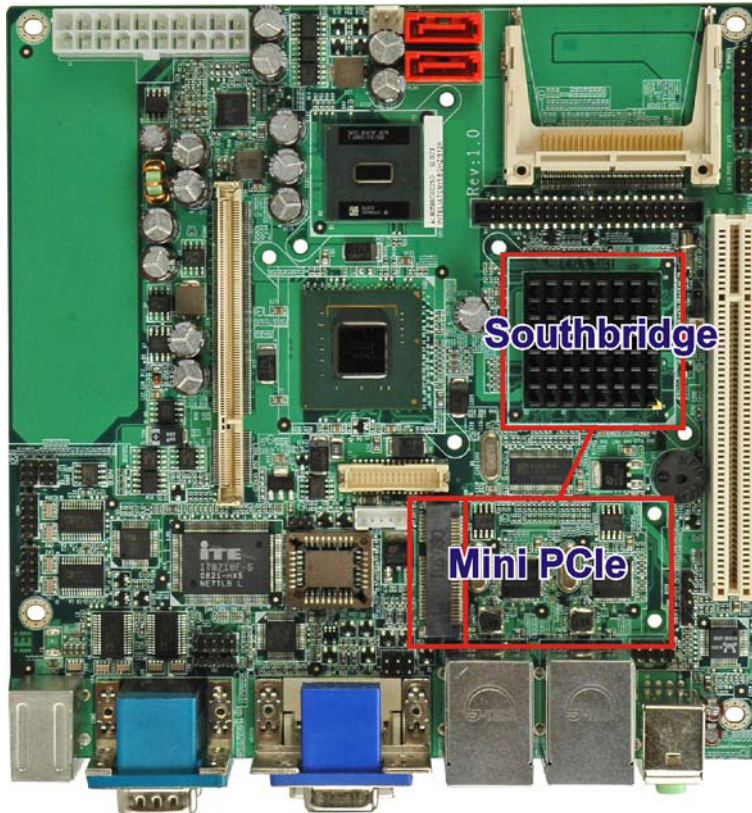


Figure 2-14: PCIe Mini Card Slot

The PCIe Mini card slot contains a PCIe x1 and USB 2.0 interface. PCIe Mini cards can utilize either of these two interfaces, depending on design requirements.

2.5.6 Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818 A real time clock (RTC) integrated into the ICH6. The RTC operates on a 3 V battery and 32.768 KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.5.7 SATA Controller

The integrated SATA controller on the Intel® ICH7M Southbridge supports two SATA drives with independent DMA operations. Two SATA controllers are connected to two SATA connectors on the 2808130. The SATA connectors are shown in Figure 2-15.

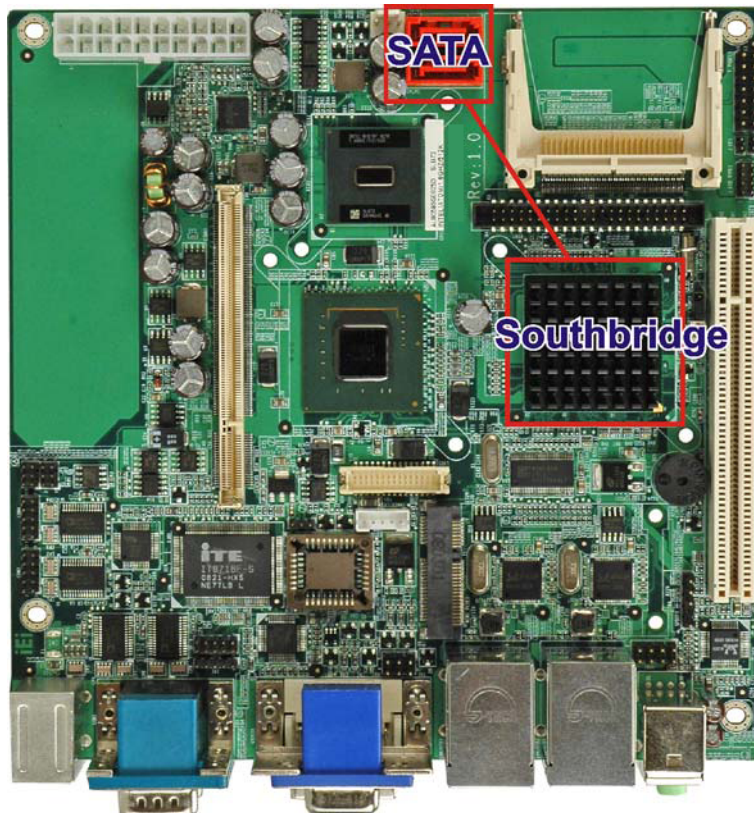


Figure 2-15: SATA Connectors

SATA controller specifications are listed below.

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

2.5.8 USB Controller

Up to six high-speed, full-speed or low-speed USB devices are supported by the Intel® ICH7M on the 2808130. High-speed USB 2.0, with data transfers of up to 480 MB/s, is enabled with the Intel® ICH7M integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the Intel® ICH7M integrated Universal Host Controller Interface (UHCI) controllers.

The six USB ports implemented on the 2808130 are connected to three internal connectors and one external connector. See **Figure 2-16**.

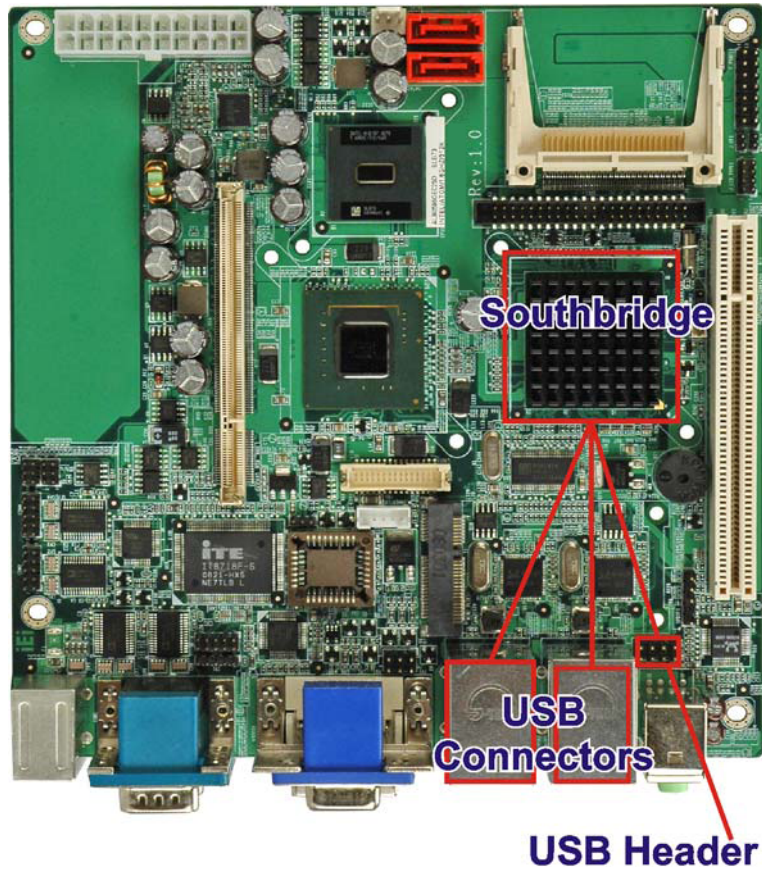


Figure 2-16: Onboard USB Implementation

2.6 LPC Bus Components

The ITE IT8718F LPC bus is connected to components listed below:

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

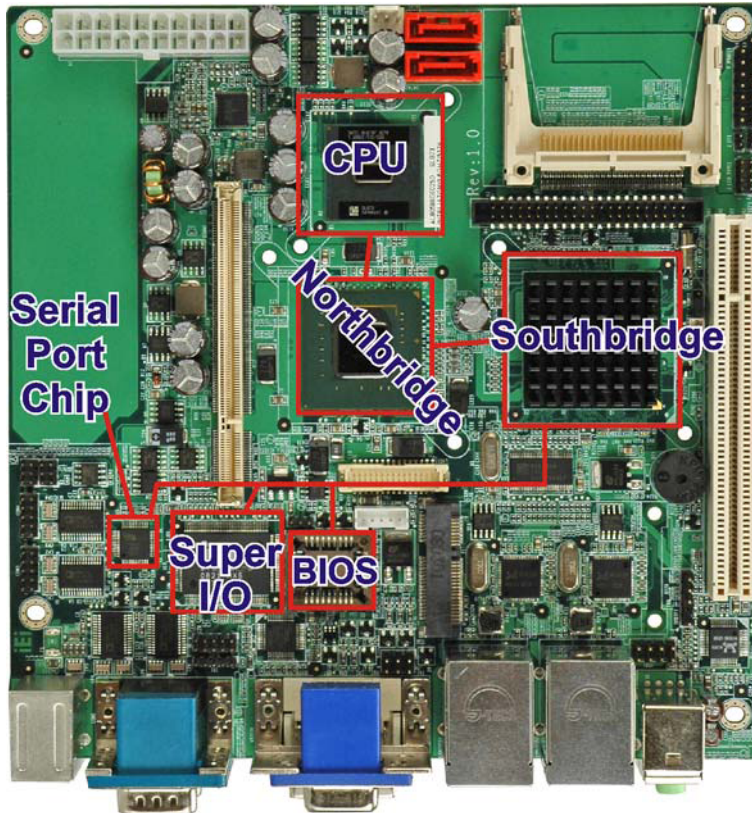


Figure 2-17: LPC Bus

2.6.1 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

2.6.2 iTE IT8718F Super I/O chipset

The iTE IT8718F Super I/O chipset is connected to the Intel® ICH7M Southbridge through the LPC bus. The iTE IT8718F is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the iTE IT8718F chipset are listed below:

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

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

2.6.2.1 LPC Interface

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

2.6.2.2 16C550 UARTs

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

- Two standard serial ports
- IrDa 1.0 and ASKIR protocols

2.6.2.3 Digital Input/Output

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

2.6.2.4 Enhanced Hardware Monitor

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

2.6.2.5 Fan Speed Controller

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

2.6.2.6 Keyboard/Mouse Controller

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

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

2.6.2.7 Parallel Port

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

2.6.3 Fintek F81216D LPC Serial Port Chipset

The Fintek F81216D chipset enables the addition of two additional UART serial ports (COM3 and COM4). UART includes 16-byte send/receive FIFO. The Fintek F81216D serial port chipset is interfaced to the Southbridge chipset through the LPC bus. Some of the features of the Fintek F81216D 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

2.7 Environmental and Power Specifications

2.7.1 System Monitoring

Two thermal inputs on the 2808130 Super I/O Enhanced Hardware Monitor monitors the following temperatures:

-
- CPU temperature
 - System temperature

The 2808130 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

Voltage inputs on the 2808130 Super I/O Enhanced Hardware Monitor monitors the following voltages:

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

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

2.7.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the 2808130 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 2-2 shows the power consumption parameters for the 2808130 running with a 1.60 GHz Intel® Atom™ with 2.0 GB DDR2 memory.

Voltage	Current
+5 V	2.89 A
+12 V	0.04 A

Table 2-2: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 2808130. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 2808130, 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 2808130, place it on an anti-static pad. This reduces the possibility of ESD damaging the 2808130.
- **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 2808130 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 2808130 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

3.3.1 Package Contents

The 2808130 is shipped with the following components:

Quantity	Item and Part Number	Image
1	2808130	
2	SATAcable	
1	Dual RS-232 cable	
1	I/O shielding	
1	Mini jumper pack (2.0 mm)	
1	Utility CD	


Quantity	Item and Part Number	Image
1	Quick Installation Guide	

Table 3-1: Packing List

3.3.2 Optional Items

The 2808130 is shipped with the following components:







Item and Part Number	Image
Dual USB cable (wo bracket)	
ATX cable	
HDTV output cable	
HDD cable	
IDE-cable	
SATA power cable	

Table 3-2: Power Consumption

Chapter

4

Connectors

4.1 Peripheral Interface Connectors

This chapter outlines all internal and external connectors on the 2808130.

4.1.1 Layout

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

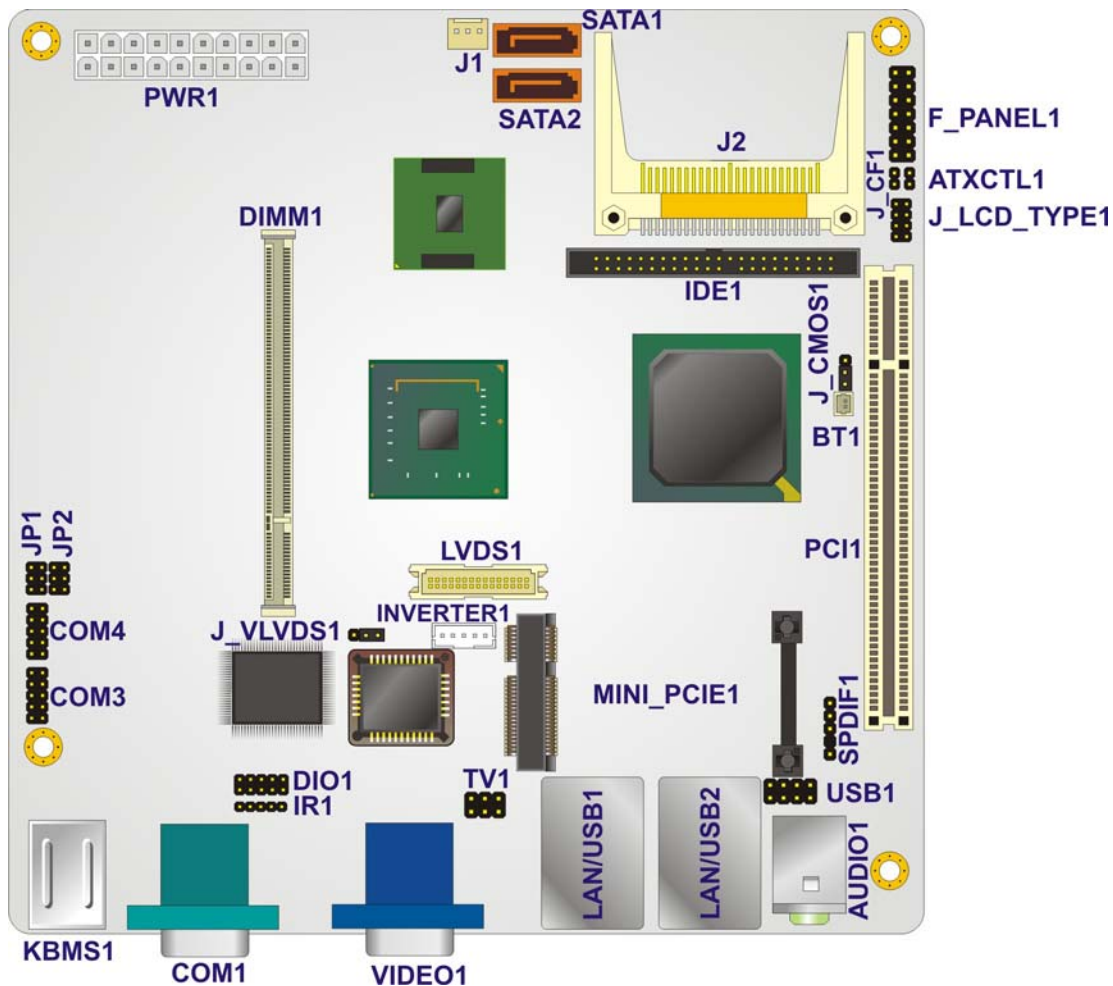


Figure 4-1: Connector and Jumper Locations [Front Side]

4.1.2 Internal Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the 2808130. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power connector	20-pin power connector	PWR1
Battery connector	2-pin box header	BT1
CompactFlash® slot	CompactFlash® slot	J2
DDR2 SO-DIMM slot	SO-DIMM connector	DIMM1
Digital I/O connector	10-pin header	DIO1
Fan connector	3-pin wafer	J1
Front panel connector	14-pin header	F_PANEL1
IDE connector	44-pin box header	IDE1
Infrared connector	5-pin header	IR1
LCD backlight inverter connector	5-pin box header	INVERTER1
LVDS connector	30-pin crimp	LVDS1
PCIe Mini slot	PCIe Mini connector	MINI_PCIE1
RS-232 connector	10-pin header	COM3
RS-232 connector	10-pin header	COM4
RS-422/485 connector (COM3)	6-pin header	JP2
SATA connector	SATA port	SATA1
SATA connector	SATA port	SATA2
TV output connector	6-pin header	TV1
USB connector (2 ports)	8-pin header	USB1

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the 2808130. Detailed descriptions of these connectors can be found in **Section 4.3** on **page 58**.

Connector	Type	Label
Audio connector	Dual audio jack	AUDIO1

Connector	Type	Label
DVI / VGA combo connector	VGA and DVI connector	VIDEO1
LAN / USB combo connector	LAN and 2 x USB	LAN/USB1 LAN/USB2
PS/2 keyboard / mouse connector	2 x PS/2	KBMS1
Serial port connector	2 x DB-9 male	COM1

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 2808130.

4.2.1 ATX Power Connector

CN Label:	PWR1
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.

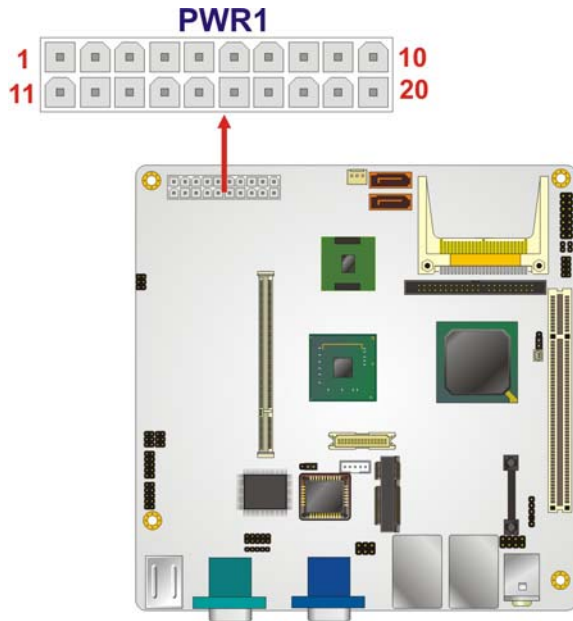


Figure 4-2: ATX Power Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3 V	11	+3.3V
2	+3.3 V	12	-12V
3	GND	13	GND
4	+5 V	14	PS-ON
5	GND	15	GND
6	+5 V	16	GND
7	GND	17	GND
8	PW-OK	18	-5 V
9	+VCC5SB	19	+5 V
10	+12 V	20	+5 V

Table 4-3: ATX Power Connector Pinouts

4.2.2 Battery Connector

CN Label: BT1
CN Type: 2-pin wafer (1x2)
CN Location: See **Figure 4-3**

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

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.

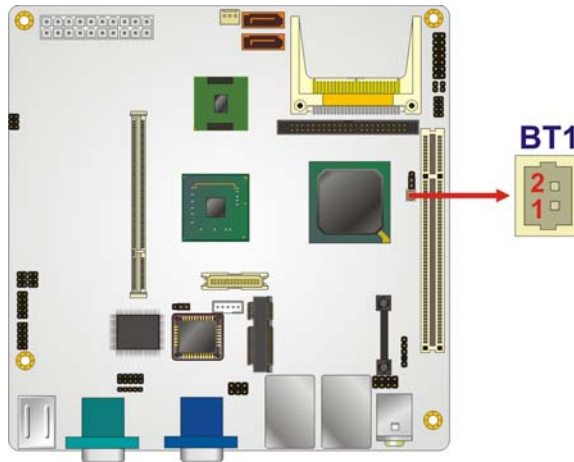


Figure 4-3: Battery Connector Location

PIN NO.	DESCRIPTION
1	Battery+
2	Ground

Table 4-4: Battery Connector Pinouts

4.2.3 CompactFlash® Socket

CN Label: J2

CN Type: CompactFlash® slot

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

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

The CompactFlash® card slot allows a CompactFlash® type I or II card to be installed.

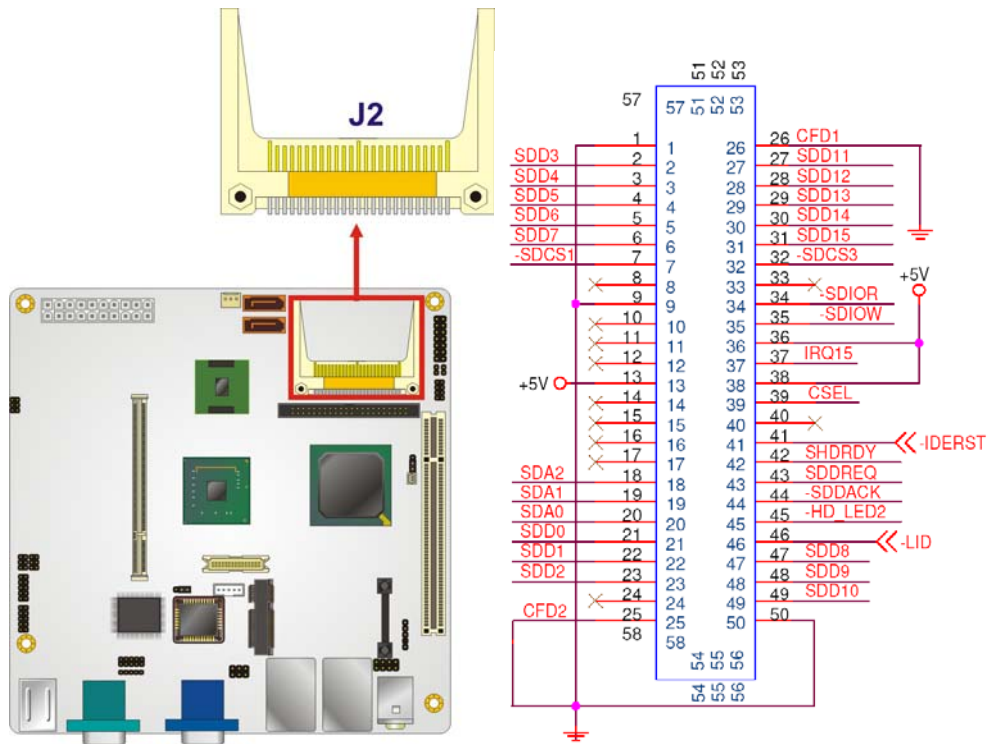


Figure 4-4: CF Card Socket Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	CE#	32	CE2#
8	A10	33	VS1#
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	IRQ
13	VCC	38	VCC
14	A6	39	CSEL#
15	A5	40	VS2#

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
16	A4	41	RESET#
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	BVD2
21	DATA 0	46	BVD1
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	IOCS16#	49	DATA 10
25	CD2#	50	GND2

Table 4-5: CF Card Socket Pinouts

4.2.4 Digital I/O Connector

- CN Label:** DIO1
- CN Type:** 10-pin header (2x5)
- CN Location:** See **Figure 4-5**
- CN Pinouts:** See **Table 4-6**

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable.

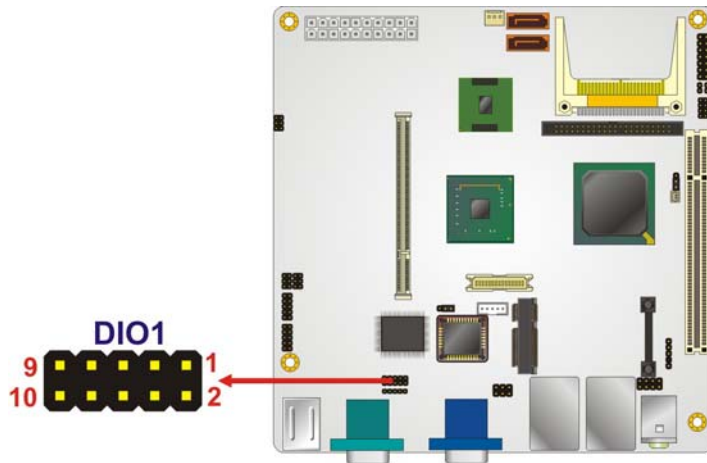


Figure 4-5: Digital I/O Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 4-6: DIO Connector Pinouts

4.2.5 Fan Connector

- CN Label:** J1
- CN Type:** 3-pin header
- CN Location:** See **Figure 4-6**
- CN Pinouts:** See **Table 4-7**

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

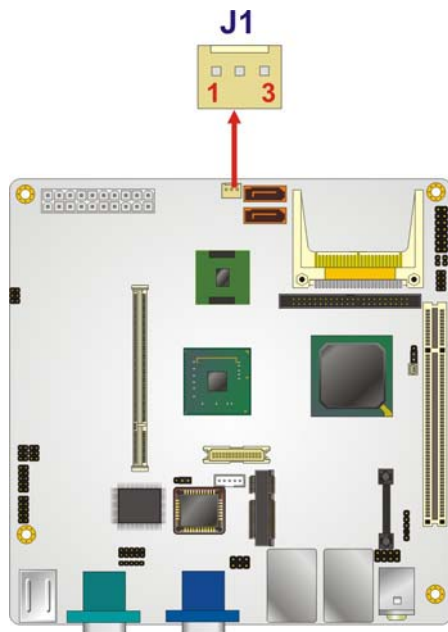


Figure 4-6: CPU Fan Connector Location

PIN NO.	DESCRIPTION
1	Fan Speed Detect
2	+12 V
3	GND

Table 4-7: CPU Fan Connector Pinouts

4.2.6 Front Panel Connector

- CN Label:** F_PANEL1
- CN Type:** 14-pin header (2x7)
- CN Location:** See **Figure 4-7**
- CN Pinouts:** See **Table 4-8**

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

- Power button
- Reset

- Speaker
- Power LED
- HDD LED

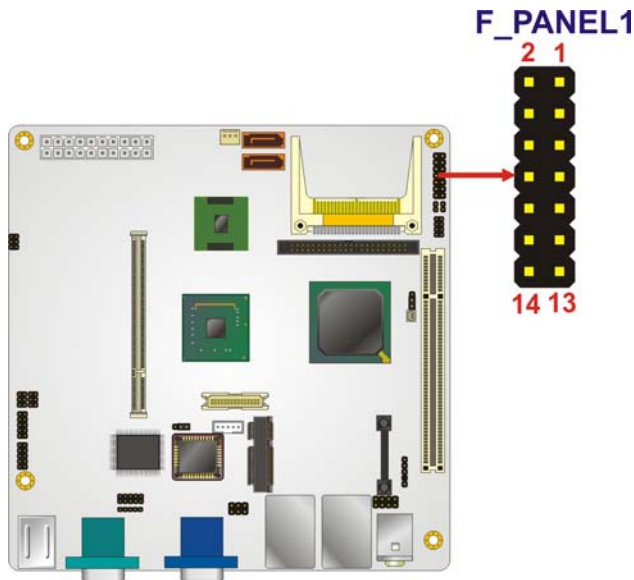


Figure 4-7: Front Panel Connector Pinout Locations

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

Table 4-8: Front Panel Connector Pinouts

4.2.7 IDE Connector

- CN Label:** IDE1
- 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 2808130 supports connectivity to two hard disk drives.

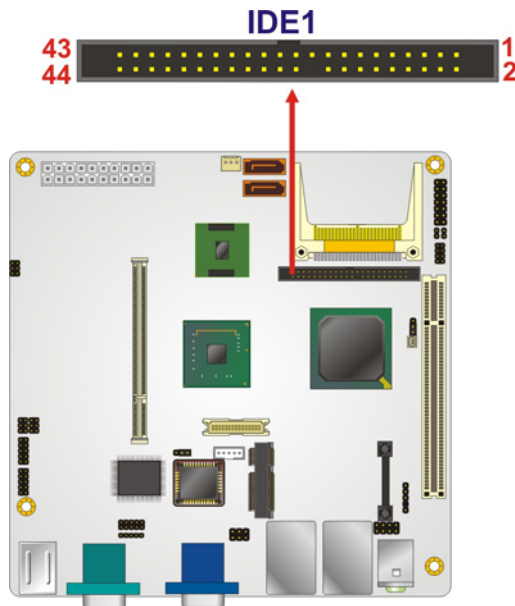


Figure 4-8: IDE Device Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	BALE-DEFAULT
29	IDE DACK	30	GROUND-DEFAULT

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
31	INTERRUPT	32	N/C
33	SA1	34	PDIAG#
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: IDE Connector Pinouts

4.2.8 Infrared Interface Connector

- CN Label:** IR1
- 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.

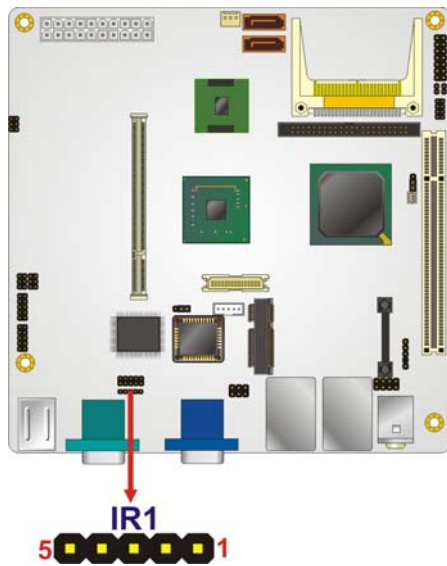


Figure 4-9: Infrared Connector Pinout Locations

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

Table 4-10: Infrared Connector Pinouts

4.2.9 LCD Backlight Inverter Connector

- CN Label:** INVERTER1
- CN Type:** 5-pin box header (1x5)
- CN Location:** See **Figure 4-10**
- CN Pinouts:** See **Table 4-11**

The backlight inverter connector provides the backlight on the LCD display connected to the 2808130 with +12V of power.

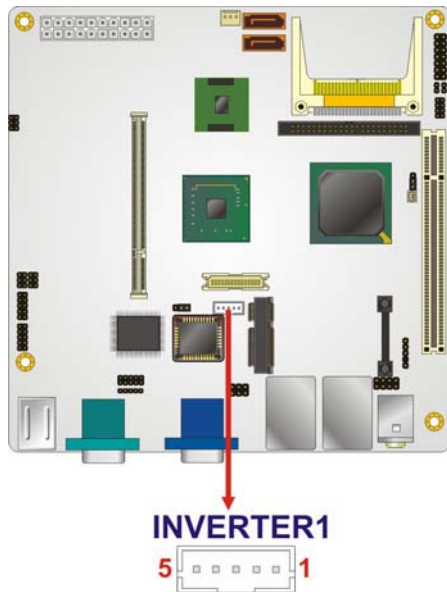


Figure 4-10: LCD Backlight Connector Pinout Locations

PIN NO.	DESCRIPTION
1	BACKLIGHT ADJUST
2	GND
3	12 V
4	GND
5	BACKLIGHT ENABLE

Table 4-11: LCD Backlight Connector Pinouts

4.2.10 LVDS LCD Connector

- CN Label:** LVDS1
- CN Type:** 30-pin crimp (2x10)
- CN Location:** See **Figure 4-11**
- CN Pinouts:** See **Table 4-12**

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

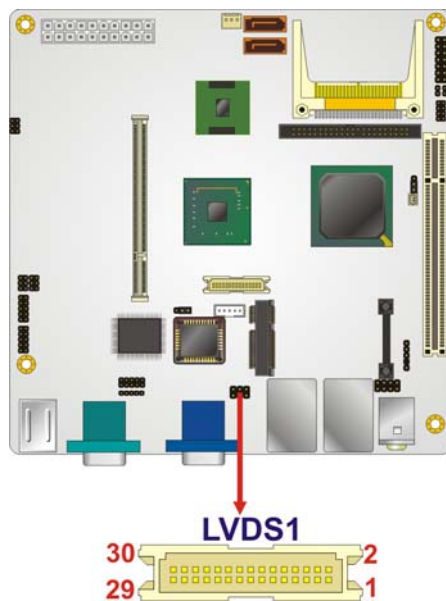


Figure 4-11: LVDS LCD Connector Pinout Locations

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 4-12: LVDS LCD Port Connector Pinouts

4.2.11 PCIe Mini Card Slot

- CN Label:** MINI_PCIE1
- CN Type:** 52-pin Mini PCIe Card Slot
- CN Location:** See **Figure 4-12**
- CN Pinouts:** See **Table 4-13**

The PCIe mini card slot enables a PCIe mini card expansion module to be connected to the board. Cards supported include among others wireless LAN (WLAN) cards.

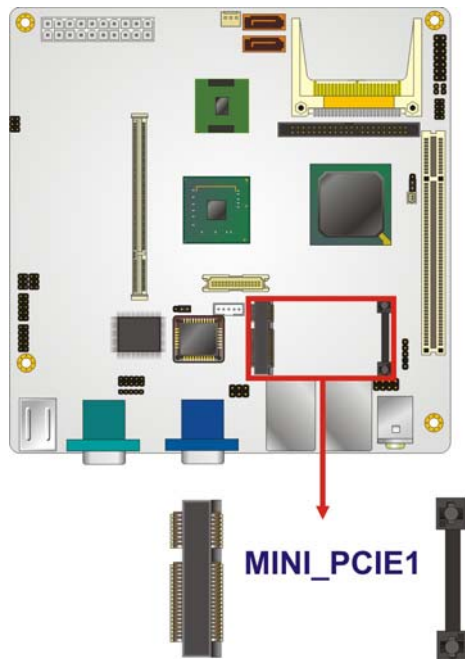


Figure 4-12: PCIe Mini Card Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	PCIE_WAKE#	2	VCC3
3	N/C	4	GND
5	N/C	6	1.5V
7	CLKREQ#	8	LFRAME#
9	GND	10	LAD3
11	CLK-	12	LAD2
13	CLK+	14	LAD1
15	GND	16	LAD0
17	PCIRST#	18	GND
19	LPC	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
35	GND	36	USBD-
37	N/C	38	USBD+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	RF_LINK#
45	N/C	46	BLUELED#
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

Table 4-13: PCIe Mini Card Slot Pinouts

4.2.12 SATA Drive Connectors

- CN Label:** SATA1, SATA2
- CN Type:** 7-pin SATA drive connectors
- CN Location:** See **Figure 4-13**
- CN Pinouts:** See **Table 4-14**

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

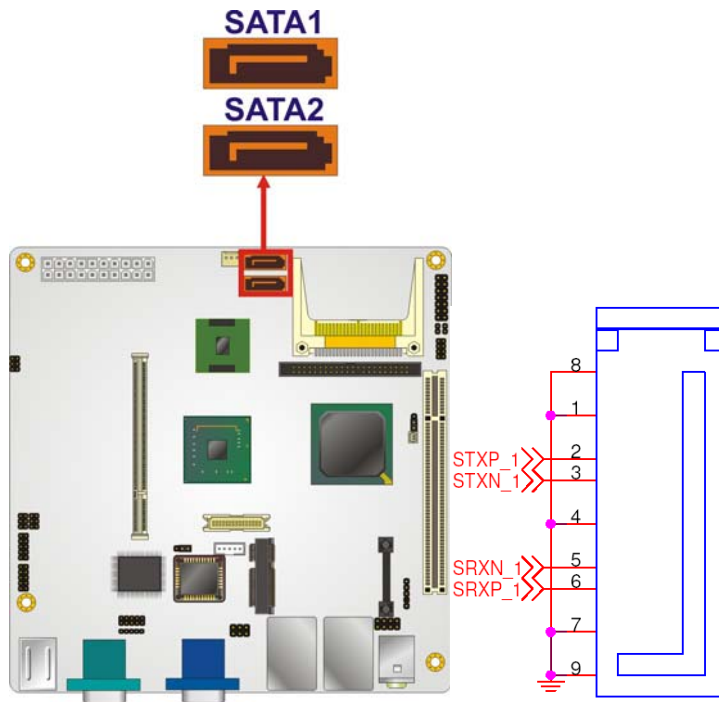


Figure 4-13: SATA Drive Connector Locations

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 Serial Port Connectors (RS-232)

- CN Label:** COM3 and COM4
- CN Type:** 10-pin header (2x5)
- CN Location:** See **Figure 4-14**
- CN Pinouts:** See **Table 4-15**

The 10-pin serial port connectors provide RS-232 serial communications channels. The COM serial port connectors can be connected to external RS-232 serial port devices. COM3 uses JP2 for RS-422 and RS-485 connectivity.

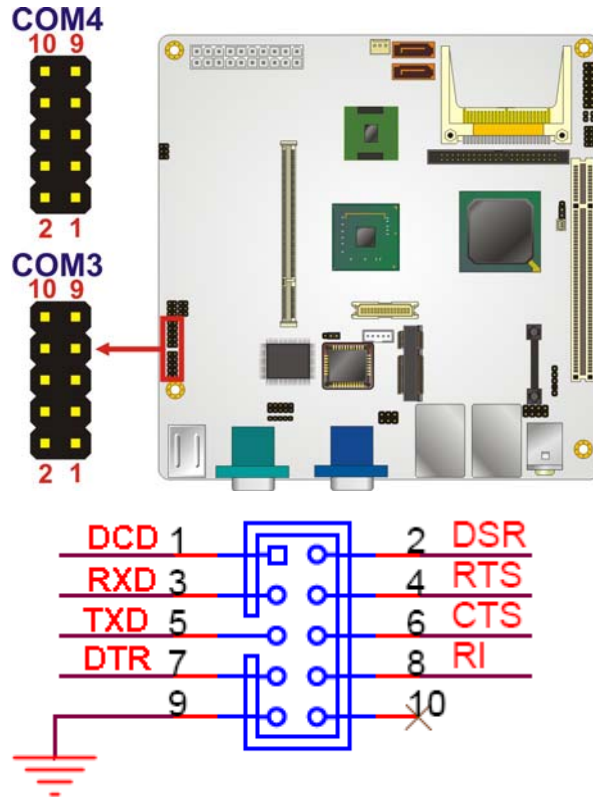


Figure 4-14: RS-232 Connector Pinout Locations

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

Table 4-15: RS-232 Connector Pinouts

4.2.14 Serial Port Connectors (RS-422/485)

CN Label: JP2

CN Type: 6-pin header (2x3)

CN Location: See Figure 4-15

CN Pinouts: See Table 4-16

The serial port connector provides the RS-422 and RS-485 pins for serial port COM3. JP1 sets COM3 to RS-232, RS-422 or RS-485, use the COM3 connector for RS-232 and the connectors on JP2 for RS-422 or RS-485 connectivity.

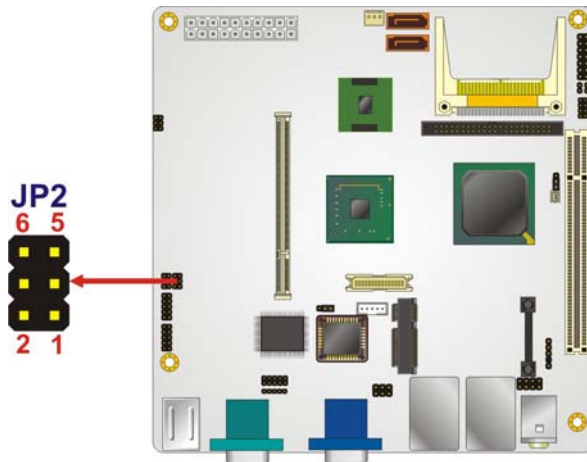


Figure 4-15: RS-422/485 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	TX_422-	2	RX3-
3	TX_422+	4	RX3+
5	Data+	6	Data-

Table 4-16: RS-422/485 Connector Pinouts

4.2.15 TV Out Connector

CN Label: TV1

CN Type: 6-pin header (2x3)

CN Location: See Figure 4-16

CN Pinouts: See Table 4-17

The 2x3 pin TV out connector connects to a TV output by using an S-Video or RCA connector. The TV out connector makes displaying media data on a television easier.

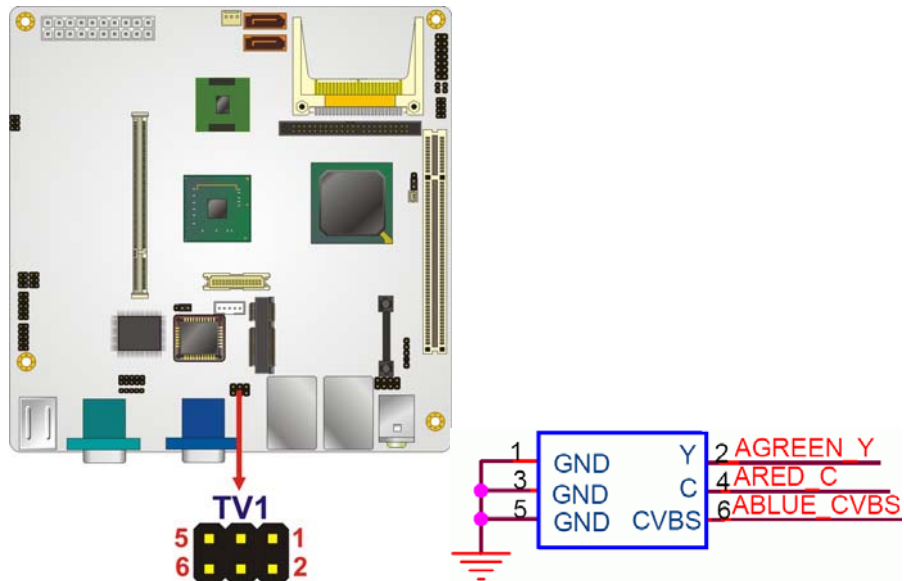


Figure 4-16: TV Connector Pinout Locations

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

Table 4-17: TV Port Connector Pinouts

4.2.16 USB Connectors

- CN Label:** USB1
- CN Type:** 8-pin header (2x4)
- CN Location:** See **Figure 4-17**
- CN Pinouts:** See **Table 4-18**

The 2x4 USB pin connector provides connectivity to two USB 1.1 or two USB 2.0 ports. The 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.

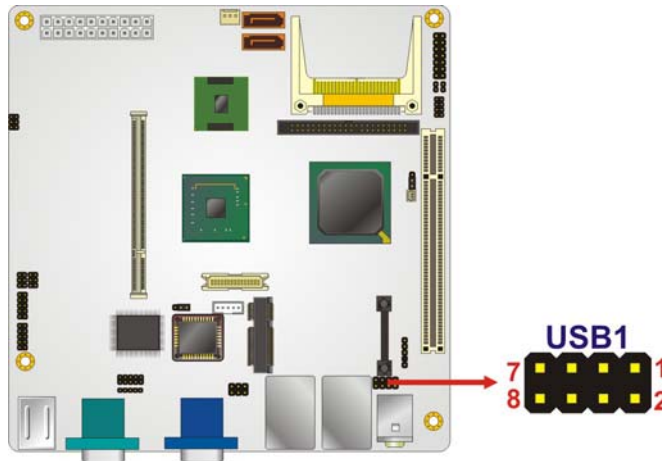


Figure 4-17: USB Connector Pinout Locations

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

Table 4-18: USB Port Connector Pinouts

4.3 External Peripheral Interface Connector Panel

Figure 4-18 shows the 2808130 external peripheral interface connector (EPIC) panel. The 2808130 EPIC panel consists of the following:

- 2 x Audio jacks
- 1 x DVI connector
- 2 x RJ-45 LAN connectors
- 2 x PS/2 connectors
- 2 x Serial port connectors
- 4 x USB connectors

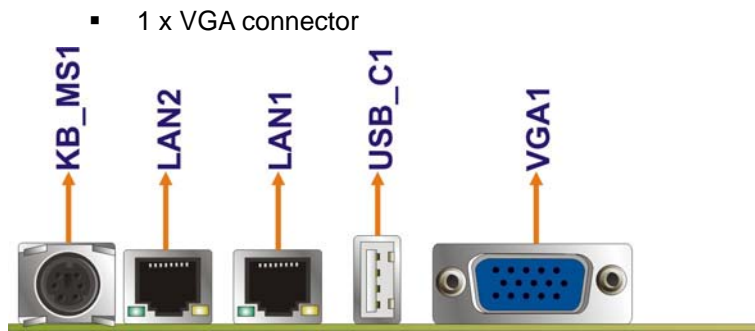


Figure 4-18: 2808130 External Peripheral Interface Connector

4.3.1 Audio Connector

CN Label: AUDIO1
CN Type: 2 x audio jacks
CN Location: See **Figure 4-18**

The three audio jacks on the external audio connector enable the 2808130 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.



Figure 4-19: Audio Connector

4.3.2 Keyboard/Mouse Connector

CN Label: KBMS1
CN Type: Dual PS/2
CN Location: See **Figure 4-18**

CN Pinouts: See Figure 4-20 and Table 4-19

The 2808130 keyboard and mouse connectors are standard PS/2 connectors.

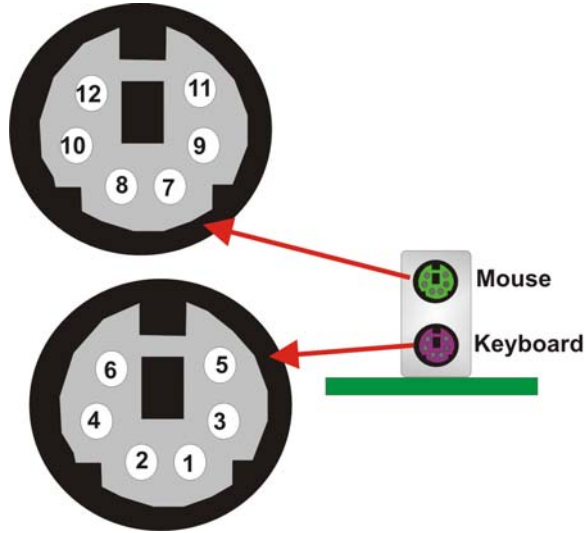


Figure 4-20: PS/2 Pinouts

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 4-19: PS/2 Connector Pinouts

4.3.3 DVI Connector

CN Label: VIDEO1 (bottom)

CN Type: DVI connector

CN Location: See Figure 4-18

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

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 4-20: DVI Connector Pinouts

4.3.4 LAN Connectors

CN Label: LAN/USB1 & LAN/USB2

CN Type: RJ-45

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

CN Pinouts: See **Table 4-21**

The 2808130 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	5	MDIA1+

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

Table 4-21: LAN Pinouts

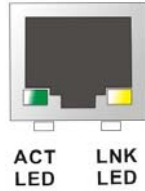


Figure 4-21: RJ-45 Ethernet Connector

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
GREEN	Activity	YELLOW	Linked

Table 4-22: RJ-45 Ethernet Connector LEDs

4.3.5 Serial Port Connectors

- CN Label:** COM1 and COM2
- CN Type:** DB-9 connectors
- CN Location:** See **Figure 4-18** (see 2)
- CN Pinouts:** See **Table 4-23** 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	DCD	6	DSR
2	RX	7	RTS

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 4-23: RS-232 Serial Port Pinouts

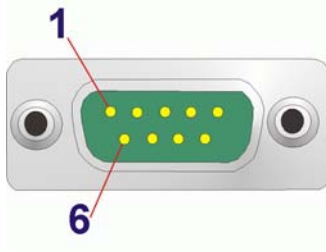


Figure 4-22: RS-232 Serial Port Pinout Locations

4.3.6 USB Connectors

- CN Label:** LAN/USB1 and LAN/USB2
- CN Type:** USB port
- CN Location:** See **Figure 4-18**
- CN Pinouts:** See **Table 4-24**

The 2808130 has one external USB 2.0 port. The ports connect to both USB 2.0 and USB 1.1 devices.

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

Table 4-24: USB Port Pinouts

4.3.7 VGA Connector

- CN Label:** VIDEO1 (top)
CN Type: 15-pin Female
CN Location: See Figure 4-18
CN Pinouts: See Figure 4-23 and Table 4-25

The 2808130 has a single 15-pin female connector for connectivity to standard display devices.

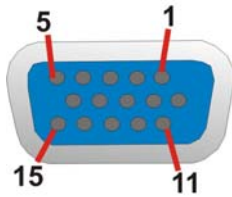


Figure 4-23: VGA Connector

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

Table 4-25: VGA Connector Pinouts

Chapter

5

Installation

5.1 Anti-static Precautions

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 2808130. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 2808130, 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 2808130, place it on an anti-static pad. This reduces the possibility of ESD damaging the 2808130.
- **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 2808130 is installed. All installation notices pertaining to the installation of the 2808130 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the 2808130 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 2808130, 2808130 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 2808130 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 2808130 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 2808130 off:
 - When working with the 2808130, 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 2808130 **DO NOT**:

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

5.2.2 Installation Checklist

The following checklist is provided to ensure the 2808130 is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The 2808130 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
 - Primary and secondary IDE device
 - SATA drives
 - Power supply
 - USB cable
 - Serial port cable
- The following external peripheral devices are properly connected to the chassis:
 - VGA screen
 - Keyboard
 - Mouse
 - RS-232 serial communications device
 - USB devices

5.3 Unpacking

When the 2808130 is unpacked, please check all the unpacking list items listed in Chapter 3 are indeed present. If any of the unpacking list items are not available please

contact the 2808130 vendor reseller/vendor where the 2808130 was purchased or contact an GAI sales representative.

5.4 SO-DIMM Installation WARNING:



Using incorrectly specified SO-DIMM may cause permanently damage the 2808130. Please make sure the purchased SO-DIMM complies with the memory specifications of the 2808130. SO-DIMM specifications compliant with the 2808130 are listed in Chapter 2.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to

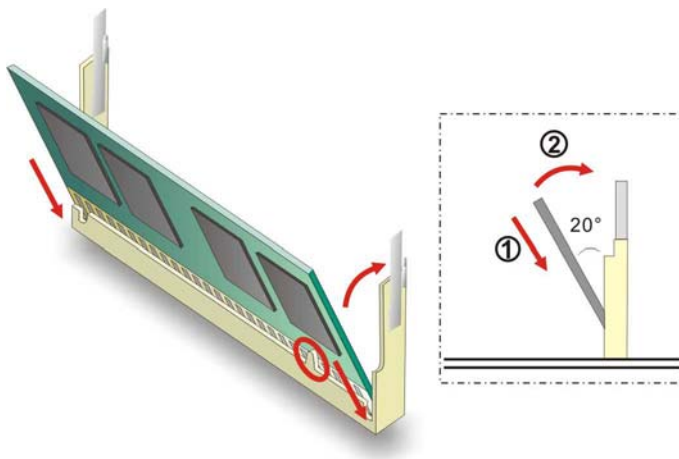


Figure 5-1: SO-DIMM Installation

- Step 1:** **Locate the SO-DIMM socket.** Place the 2808130 on an anti-static pad with the solder side facing up.
- Step 2:** **Align the SO-DIMM with the socket.** The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.

Step 3: Insert the SO-DIMM. Push the SO-DIMM chip into the socket at an angle. (See **Figure 5-1**)

Step 4: Open the SO-DIMM socket arms. Gently pull the arms of the SO-DIMM socket out and push the rear of the SO-DIMM down. (See **Figure 5-1**)

Step 5: Secure the SO-DIMM. Release the arms on the SO-DIMM socket. They clip into place and secure the SO-DIMM in the socket.

5.5 CF Card Installation



NOTE:

The 2808130 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 2808130, please follow the steps below:

Step 1: Locate the CF card socket. Place the 2808130 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.

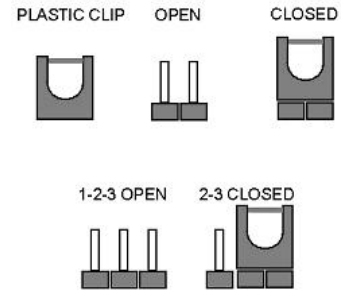
Step 3: Insert the CF card. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 5-2**.

5.6 Jumper Settings



NOTE:

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



Jumper Locations

Before the 2808130 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the 2808130 are listed in **Table 5-1**.

Description	Type	Label
ATX control	2-pin header	ATXCTL1
Clear CMOS	3-pin header	J_CMOS1
CompactFlash® master/slave	2-pin header	J_CF1
COM3 RS-232/422/485 selector	6-pin header	JP1
LCD panel type selector	8-pin header	J_LCD_TYPE1
LCD voltage selector	3-pin header	J_VLVDS1

Table 5-1: Jumpers

5.6.1 AT/ATX Selection

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

The AT/ATX Power Selection jumper specifies the systems power mode as AT or ATX. Power Selection jumper settings are shown in **Table 5-2**.

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

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

The location of the AT/ATX Power Selection jumper are shown in Figure 5-3 below.

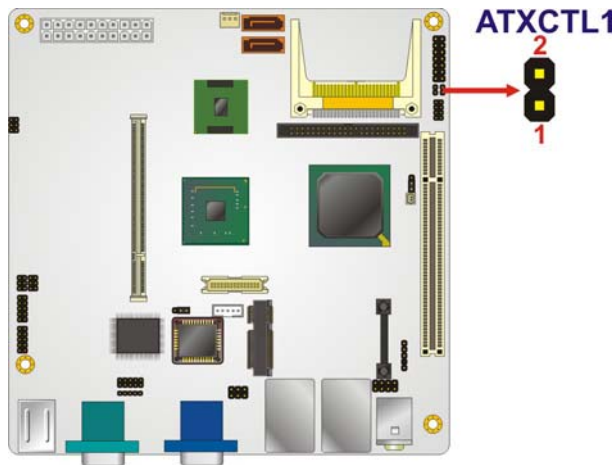


Figure 5-3: AT/ATX Power Selection Jumper Location

5.6.2 Clear CMOS Jumper

Jumper Label:	J_CMOS1
Jumper Type:	3-pin header
Jumper Settings:	See Table 5-3
Jumper Location:	See Figure 5-4

If the 2808130 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

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

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

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

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

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

Table 5-3: Clear CMOS Jumper Settings

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

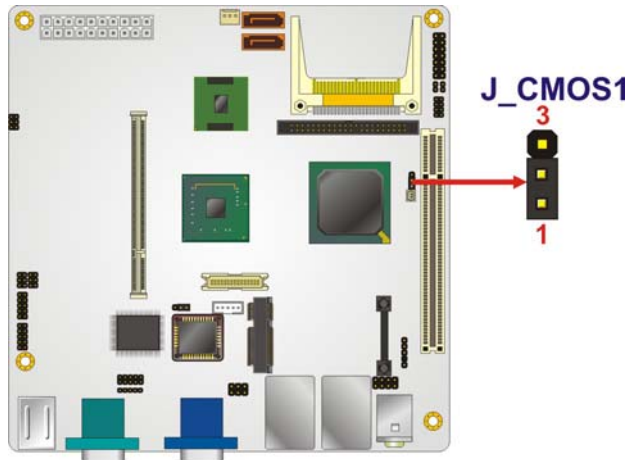


Figure 5-4: Clear CMOS Jumper

5.6.3 CF Card Setup

Jumper Label:	J_CF1
Jumper Type:	2-pin header
Jumper Settings:	See Table 5-4
Jumper Location:	See Figure 5-5

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

CF Card Setup	Description	
Open	Slave	Default
Closed	Master	

Table 5-4: CF Card Setup Jumper Settings

The CF Card Setup jumper location is shown in Figure 5-5.

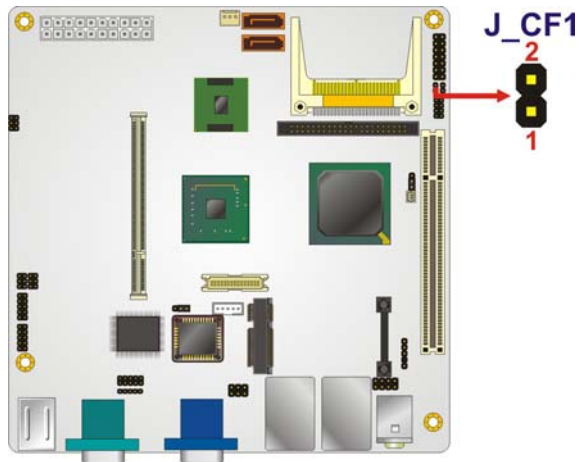


Figure 5-5: CF Card Setup Jumper Location

5.6.4 COM3 RS-232/422/485 Selection Jumper

- Jumper Label:** JP1
- Jumper Type:** 6-pin header
- Jumper Settings:** See Table 5-5
- Jumper Location:** See Figure 5-6

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

RS-232/422/485	Description	
1-2	RS-232	Default
3-4	RS-422	
5-6	RS-485	

Table 5-5: COM3 RS-232/422/485 Selection Jumper Pinouts

The RS-232/422/485 Serial Port Selection jumper location is shown in Figure 5-6.

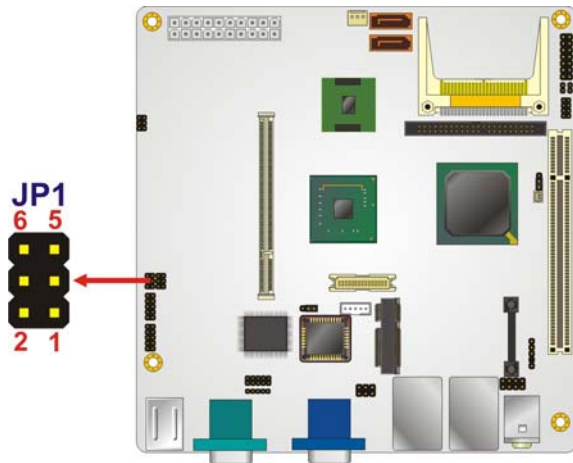


Figure 5-6: COM3 RS-232/422/485 Selection Jumper Location

5.6.5 LCD Panel Type Selection

Jumper Label:	J_LCD_TYPE1
Jumper Type:	8-pin header
Jumper Settings:	See Table 5-7
Jumper Location:	See Figure 5-8

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

LCD Panel Selection	Description	
Open	640 x 480 (18-bit)	Default
Short 1-2	800 x 600 (18-bit)	
Short 3-4	1024 x 768 (18-bit)	
Short 1-2 and 3-4	1280 x 1024 (48-bit)	
Short 3-4 and 5-6	1600 x 1200 (48-bit)	
Short 3-4 and 7-8	1024 x 768 (24-bit)	

Table 5-6: LCD Panel Type Selection Jumper Settings

The **LCD Panel Type Selection** jumper location is shown in **Figure 5-8**.

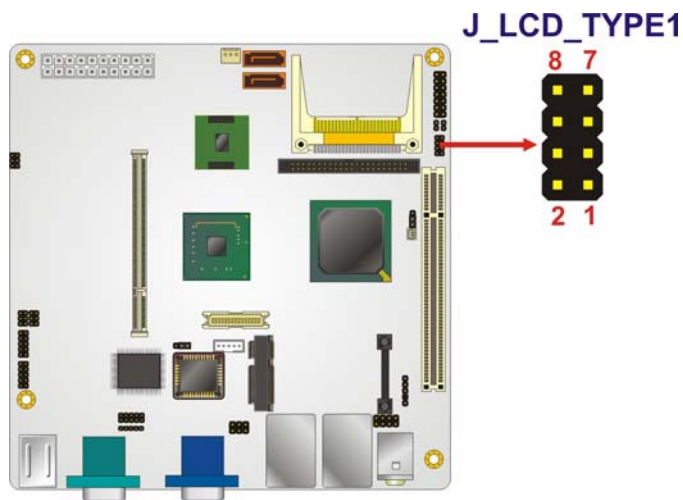


Figure 5-7: LCD Panel Type Selection Jumper Pinout Locations

5.6.6 LVDS Voltage Selection



WARNING:

Permanent damage to the screen and 2808130 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

- Jumper Label:** J_VLVDS1
- Jumper Type:** 3-pin header
- Jumper Settings:** See **Table 5-7**
- Jumper Location:** See **Figure 5-8**

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

LCD Voltage Select	Description	
1-2	3.3 V	

LCD Voltage Select	Description	
2-3	5 V	Default

Table 5-7: LVDS Voltage Selection Jumper Settings

The LVDS Voltage Selection jumper location. is shown in **Figure 5-8**.

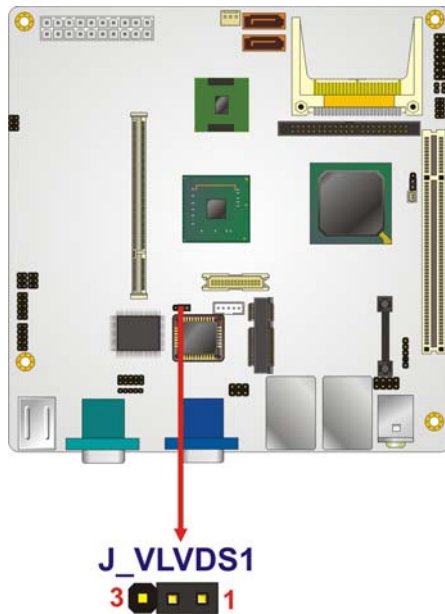


Figure 5-8: LVDS Voltage Selection Jumper Pinout Locations

5.7 Chassis Installation

5.7.1 Airflow



WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the 2808130 must have air vents to allow cool air to move into the system and hot air to move out.

The 2808130 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:

5.7.2 Motherboard Installation

To install the 2808130 motherboard into the chassis please refer to the reference material that came with the chassis.

5.8 Internal Peripheral Device Connections

The cables listed in **Table 5-8** are shipped with the 2808130.

Quantity	Type
1	Keyboard and Mouse cable
2	SATA drive cable
1	Power cable
1	Dual RS-232 cable

Table 5-8: GAI Provided Cables

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

- Dual port USB cable
- Parallel port cable
- RS-232/422/485 cable

- ATX power cable
- HDTV out cable

-
- 5.1 channel audio kit
 - 7.1 channel audio kit

5.8.1 5.1 Channel Audio Kit Installation NOTE:



The optional 5.1 channel audio kit connects to the 10-pin audio connector on the 2808130. The audio kit consists of three audio jacks. One audio jack, Mic In, connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two speakers. To install the audio kit, please refer to the steps below:

- Step 1: Connect the audio kit cable.** The audio kit is shipped with a cable that connects the audio kit to the 2808130. Connect the cable to the connector on the back of the audio kit. Make sure the pins are properly aligned (i.e. pin 1 connects to pin 1).
- Step 2: Locate the audio connector.** The location of the 10-pin audio connector is shown in **Chapter 3**.
- Step 3: Align pin 1.** Align pin 1 on the on-board connector with pin 1 on the audio kit cable connector. Pin 1 on the audio kit cable connector is indicated with a white

2808130 Motherboard

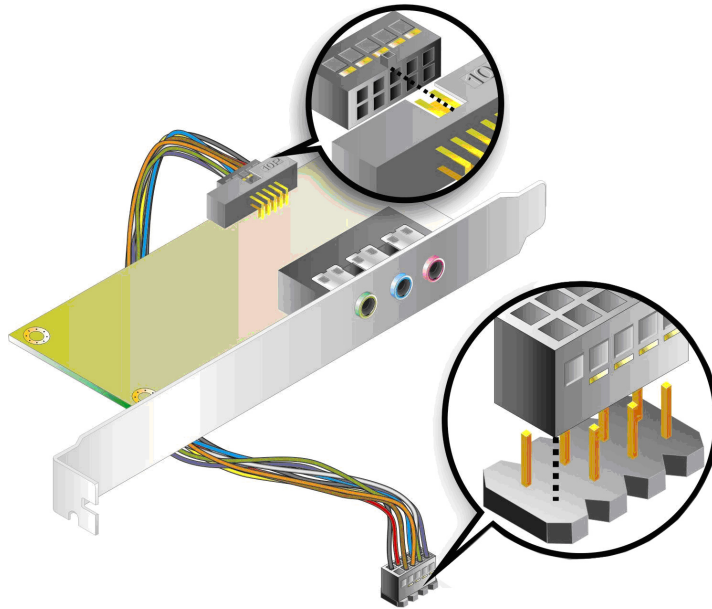


Figure 5-9: 5.1 Channel Audio Kit

Step 4: **Mount the audio kit onto the chassis.** Once the audio kit is connected to the 2808130, secure the audio kit bracket to the system chassis.

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

Step 6: **Install the driver.** If the 5.1 channel audio kit is used, the ALC655 Realtek codec driver must be installed. Refer to **Chapter 7** for driver installation instructions.

5.8.2 7.1 Channel Audio Kit Installation

The optional 7.1 channel audio kit connects to the 10-pin audio connector on the 2808130. The audio kit consists of five audio jacks. One audio jack, Mic In, connects to a microphone. The remaining four audio jacks, Line-In, Front-Out, Rear-Out, and Center Subwoofer, connect to speakers. To install the audio kit, please refer to the steps below:

- Step 1: Connect the audio kit cable.** The audio kit is shipped with a cable that connects the audio kit to the 2808130. Connect the cable to the connector on the back of the audio kit. Make sure the pins are properly aligned (i.e. pin 1 connects to pin 1).
- Step 2: Locate the audio connector.** The location of the 10-pin audio connector is shown in **Chapter 3**.
- Step 3: Align pin 1.** Align pin 1 on the on-board connector with pin 1 on the audio kit cable connector. Pin 1 on the audio kit cable connector is indicated with a white dot. See Figure 5-10.

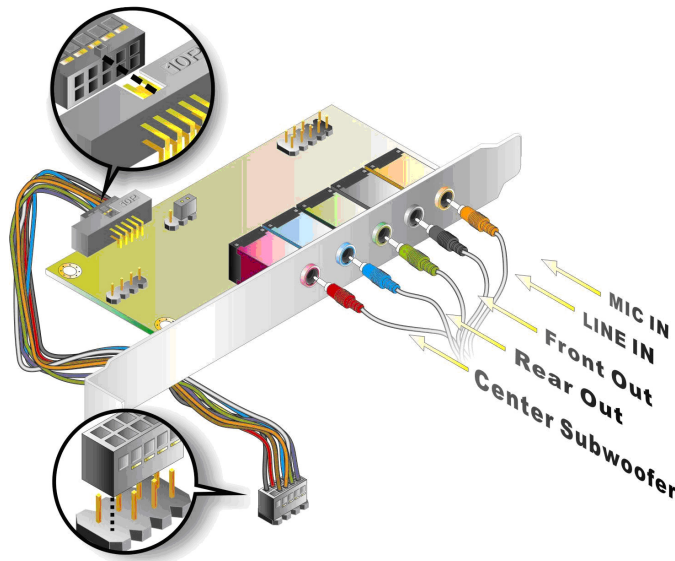


Figure 5-10: 7.1 Channel Audio Kit

- Step 4: Mount the audio kit onto the chassis.** Once the audio kit is connected to the 2808130, secure the audio kit bracket to the system chassis.

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

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

5.8.3 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to the 2808130 to one or two IDE devices. To connect an IDE HDD to the 2808130 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 5-11**. A key on the front of the cable connector ensures it can only be inserted in one direction.

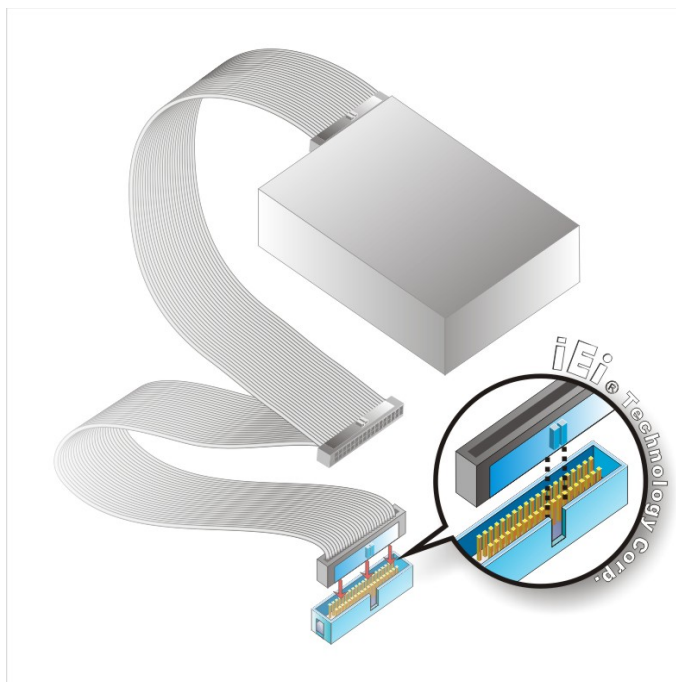


Figure 5-11: IDE Cable Connection

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

5.8.4 SATA Drive Connection

The 2808130 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 5-12**.

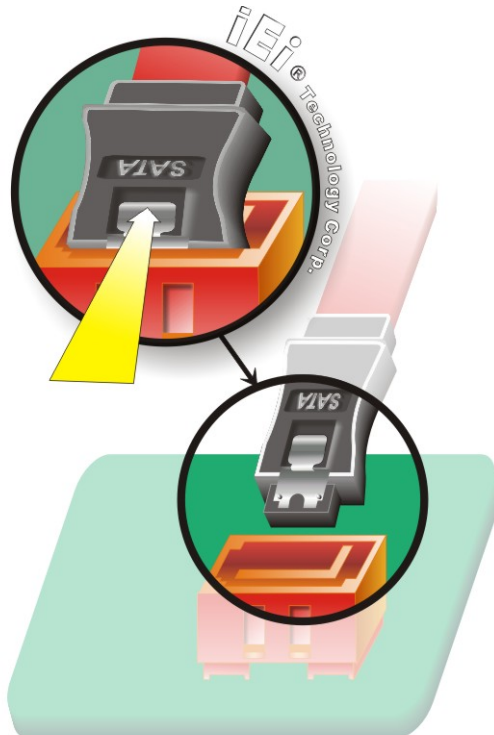


Figure 5-12: SATA Drive Cable Connection

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 5-13**.

Step 4: Connect the SATA power cable. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-13**.



Figure 5-13: SATA Power Drive Connection

5.8.5 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 5-14**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

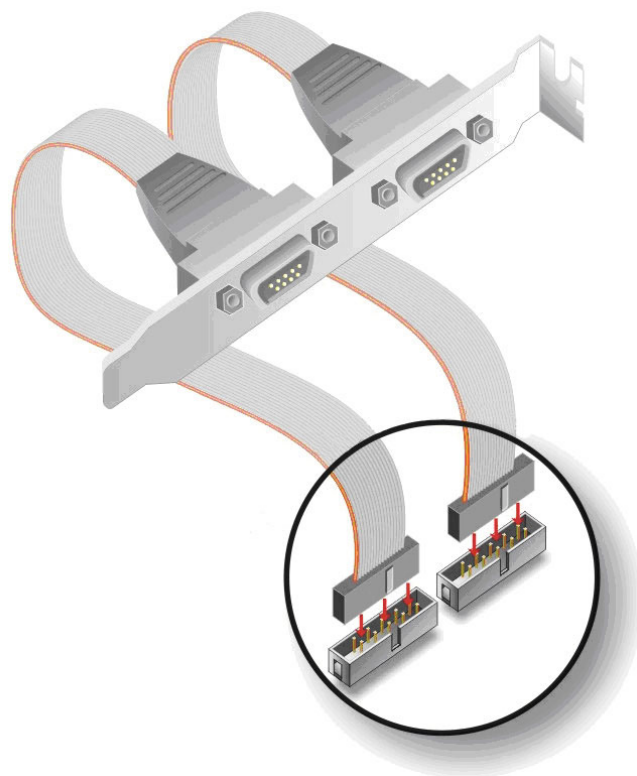


Figure 5-14: Dual RS-232 Cable Installation

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

5.8.6 USB Cable (Dual Port) with Slot Bracket

The 2808130 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.**

Step 2: Align the connectors. The cable has two connectors. Correctly align pin 1 on each cable connector with pin 1 on the 2808130 USB connector.

Step 3: Insert the cable connectors. Once the cable connectors are properly aligned with the USB connectors on the 2808130, connect the cable connectors to the on-board connectors. See **Figure 5-15**.

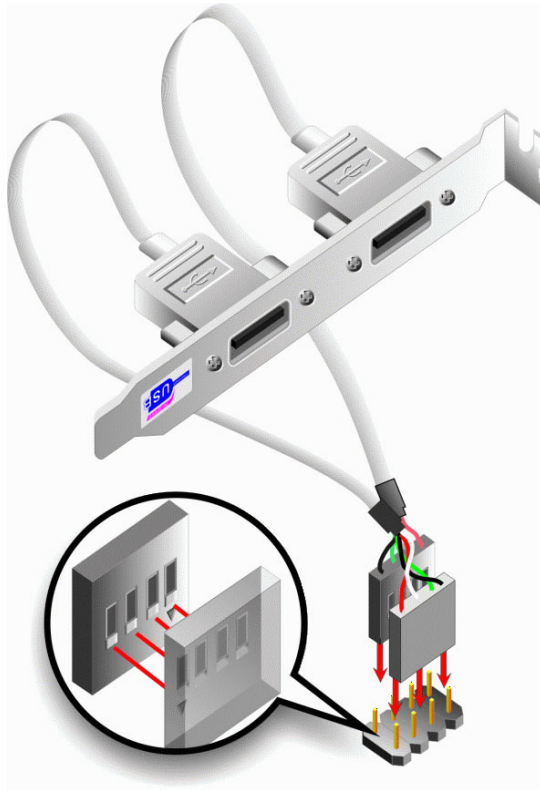


Figure 5-15: Dual USB Cable Connection

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

5.8.7 Parallel Port Cable without Bracket

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

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

Step 2: Align the connectors. Correctly align pin 1 on the cable connector with pin 1 on the 2808130 LPT box-header connector. See Figure 5-16.

Step 3: Insert the cable connectors Once the cable connector is properly aligned with the 26-pin box-header connector on the 2808130, connect the cable connector to the on-board connector. See **Figure 5-16**.

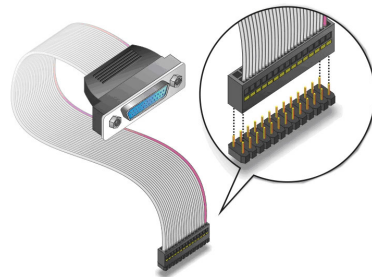


Figure 5-16: LPT Cable Connection

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

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

Figure 5-17

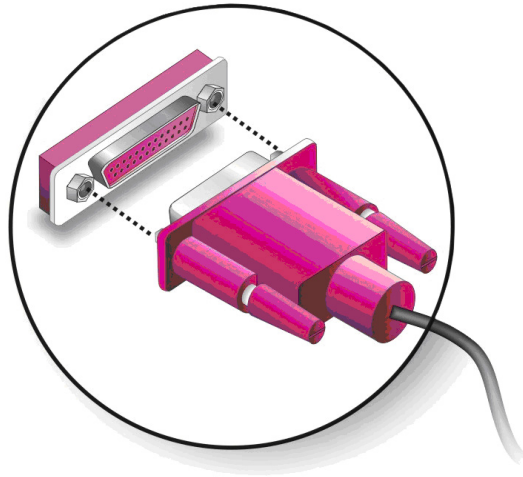


Figure 5-17: Connect the LPT Device

5.9 External Peripheral Interface Connection

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

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

To install these devices, connect the corresponding cable connector from the actual device to the corresponding 2808130 external peripheral interface connector making sure the pins are properly aligned.

5.9.1 LAN Connection (Single Connector)

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 2808130 . See **Figure 5-18**.

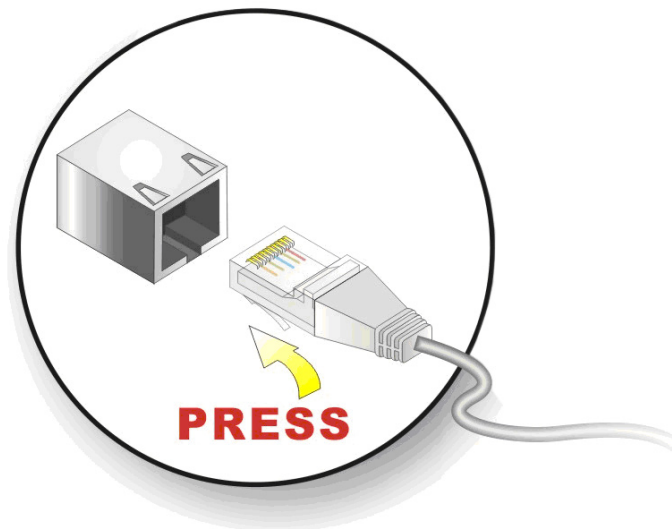


Figure 5-18: LAN Connection

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

5.9.2 PS/2 Y-Cable Connection

The 2808130 has a PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is connected to the PS/2 Y-cable that came with the 2808130. One of the PS/2 cables is connected to a keyboard and the other to a mouse to the system. Follow the steps below to connect a keyboard and mouse to the 2808130.

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

Step 2: Insert the keyboard/mouse connector. Insert the PS/2 connector on the end of the PS/2 y-cable into the external PS/2 connector. See **Figure 5-19**.

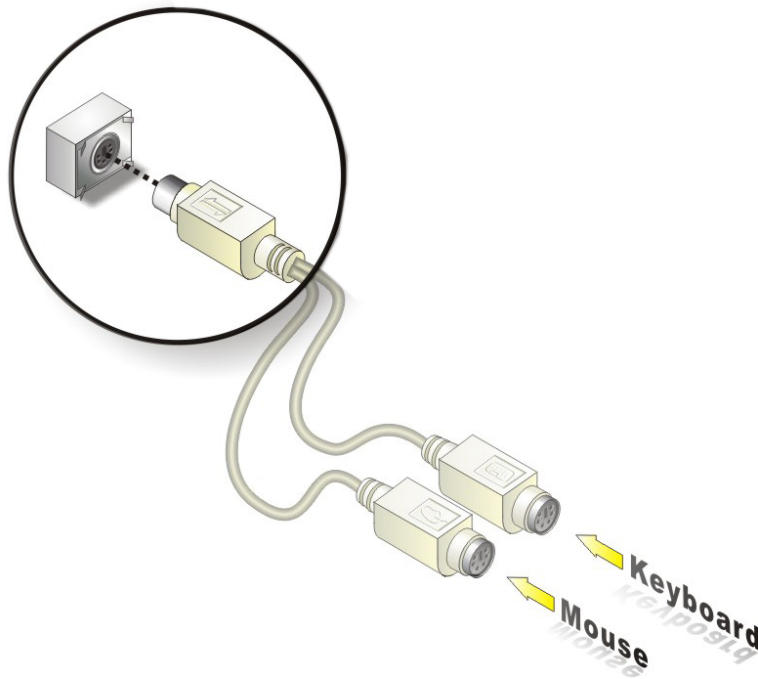


Figure 5-19: PS/2 Keyboard/Mouse Connector

Step 3: Connect the keyboard and mouse. Connect the keyboard and mouse to the appropriate connector. The keyboard and mouse connectors can be distinguished from each other by looking at the small graphic at the top of the connector.

5.9.3 Serial Device Connection

The 2808130 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 2808130.

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.

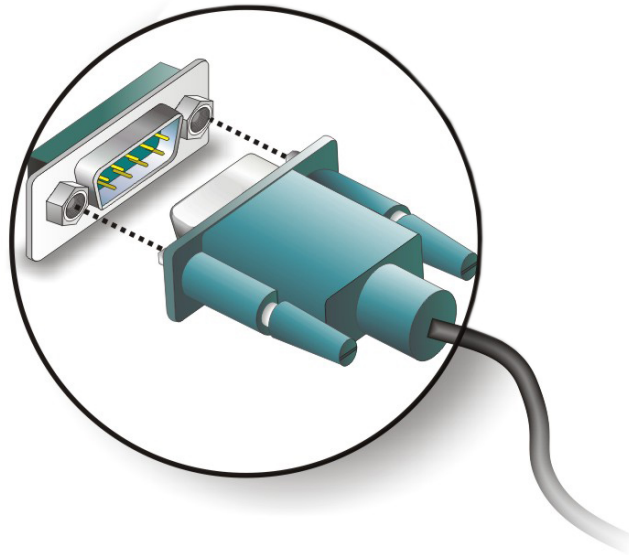


Figure 5-20: Serial Device Connector

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.

5.9.4 USB Connection (Dual Connector)

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 2808130.

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**.

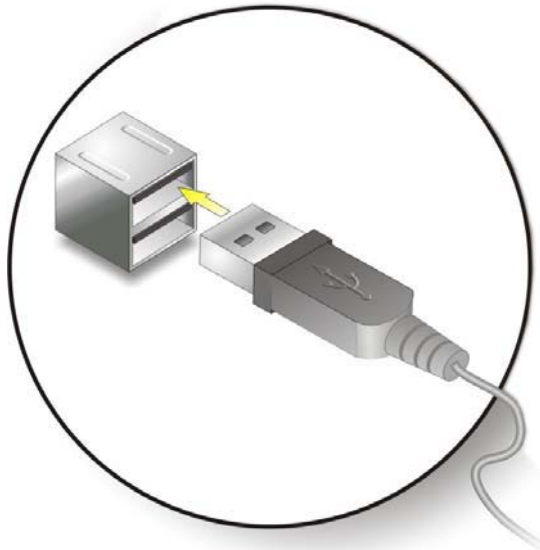


Figure 5-21: USB Connector

5.9.5 VGA Monitor Connection

The 2808130 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 2808130, 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.

Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support your products, projects and business.



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