



integration with integrity

3308480 User's Manual

3.5" Embedded Controller with Intel Atom N270

Version 1.0

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# Packing List

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The items listed below should all be included in the 3308480 package.

- 1 x 3308480 Single Board Computer
- 1 x 4-port RS-232 cable
- 2 x SATA Cable
- 1 x KB/MS Cable
- 1 x Audio Cable
- 1 x Enclosure Heatsink
- 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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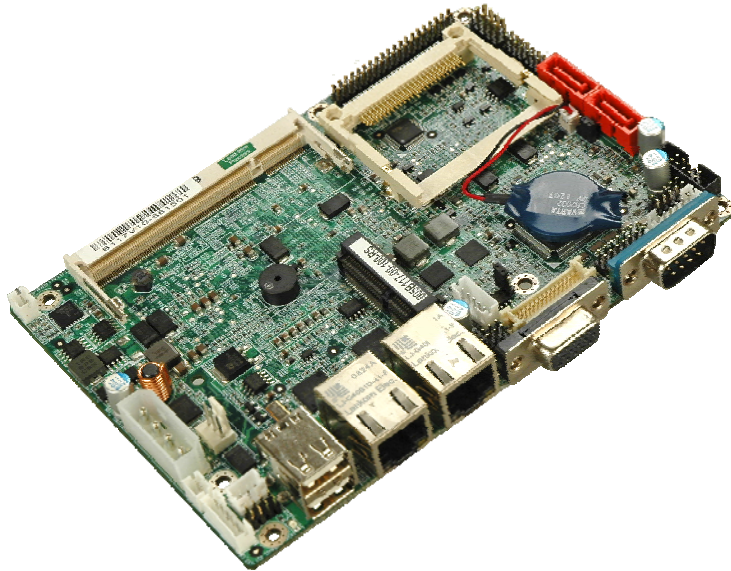
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# Introduction

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## 1.1 Overview



**Figure 1-1: 3308480**

### 1.1.1 3308480 Introduction

The 3308480 3.5" motherboards are embedded 45 nm Intel® Atom™ processor platforms. The Intel® Atom™ processor N270 embedded on the 3308480 has a 1.60 GHz clock speed, a 533 MHz FSB and a 512 KB L2 cache. The 3308480 also supports one 200-pin 533 MHz 2.0 GB (max.) DDR2 SDRAM SO-DIMM. The board comes with an LVDS connector and supports both 18-bit and 36-bit single channel LVDS screens. The 3308480 also comes with two PCI Express (PCIe) Gigabit Ethernet (GbE) connectors and a PCIe mini slot on the solder side.

## 1.2 3308480 Overview

### 1.2.1 3308480 Overview Photo

The 3308480 has a wide variety of peripheral interface connectors.

**Figure 1-2** is a

labeled photo of the peripheral interface connectors on the 3308480.

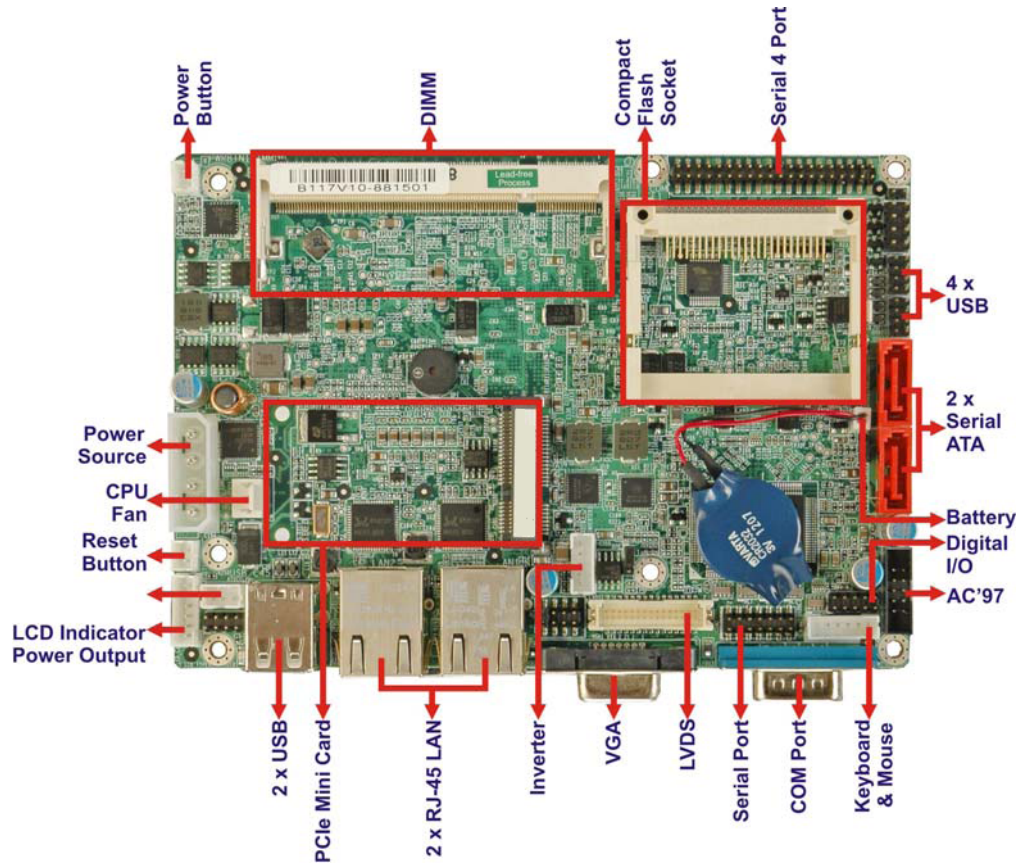


Figure 1-2: 3308480 Overview [Front View]

### 1.2.2 3308480 Peripheral Connectors and Jumpers

The 3308480 has the following connectors on-board:

- 1 x ATX power connector
- 1 x ATX enable connector
- 1 x Audio connector
- 1 x Backlight inverter connector
- 1 x CompactFlash® socket
- 1 x Digital input/output (DIO) connector
- 1 x Fan connector
- 1 x Keyboard and mouse connector
- 1 x LED connector
- 1 x LVDS connector
- 1 x PCIe Mini Card slot

- 1 x Power button connector
- 1 x Reset button connector
- 1 x 4-port RS-232 serial port connector
- 1 x RS-232/422/485 serial port connector
- 2 x Serial ATA (SATA) drive connectors
- 2 x USB 2.0 connectors (supports four USB 2.0 devices)

The 3308480 has the following external peripheral interface connectors on the board rear panel.

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

The 3308480 has the following on-board jumpers:

- AT Power Mode Setting
- Clear CMOS
- CF card setup
- LVDS1 Voltage Selection
- LVDS1 Panel Resolution Selection
- COM2 Port Mode setting

### 1.2.3 Technical Specifications

3308480 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	3308480
Form Factor	3.5"
System CPU	45 nm 1.6 GHz Intel® Atom™ N270
Front Side Bus (FSB)	533 MHz
System Chipset	Northbridge: Intel® 945GSE Southbridge: Intel® ICH7-M



<b>Memory</b>	One 200-pin SO-DIMM socket supports one 400 MHz or 533 MHz 2.0 GB (max.) DDR2 SDRAM SO-DIMM
<b>CompactFlash®</b>	One CompactFlash® Type II socket
<b>Super I/O</b>	ITE IT8718
<b>Display</b>	Intel® Generation 3.5 integrated GFX core (133 MHz) 18-bit dual channel LVDS integrated in Intel® 945GSE Dual-display supported (VGA and LVDS)
<b>BIOS</b>	AMI BIOS label
<b>Audio</b>	Realtek ALC655 AC'97 codec
<b>LAN</b>	Two Realtek RTL8111CP GbE controllers
<b>COM</b>	Five RS-232 serial ports One RS-232/422/485 serial port
<b>USB2.0</b>	Six USB 2.0 devices supported: <ul style="list-style-type: none"> <li>■ Four by onboard pin-headers</li> <li>■ Two by external connectors</li> </ul>
<b>SATA</b>	Two 1.5 Gbps SATA drives supported
<b>Keyboard/mouse</b>	One internal pin-header connector
<b>Expansion</b>	One PCIe mini card (PCIe bus)
<b>Digital I/O</b>	One 8-bit digital input/output connector; 4-bit input/4-bit output through the ITE IT8718 super I/O
<b>Watchdog Timer</b>	Software programmable 1-255 sec. through the ITE IT8718 super I/O
<b>Power Supply</b>	5.0 V only 12 V for LCD/System Fan AT and ATX support

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<b>Power Consumption</b>	5V @ 2.94 A (1.6 GHz Intel® Atom™ with one 1.0 GB DDR2 SO-DIMM)
<b>Temperature</b>	0°C – 60°C (32°F - 140°F)
<b>Humidity (operating)</b>	5%~95% non-condensing
<b>Dimensions (LxW)</b>	146 mm x 102 mm
<b>Weight (GW/NW)</b>	700g/230g

**Table 1-1: Technical Specifications**

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Chapter

2

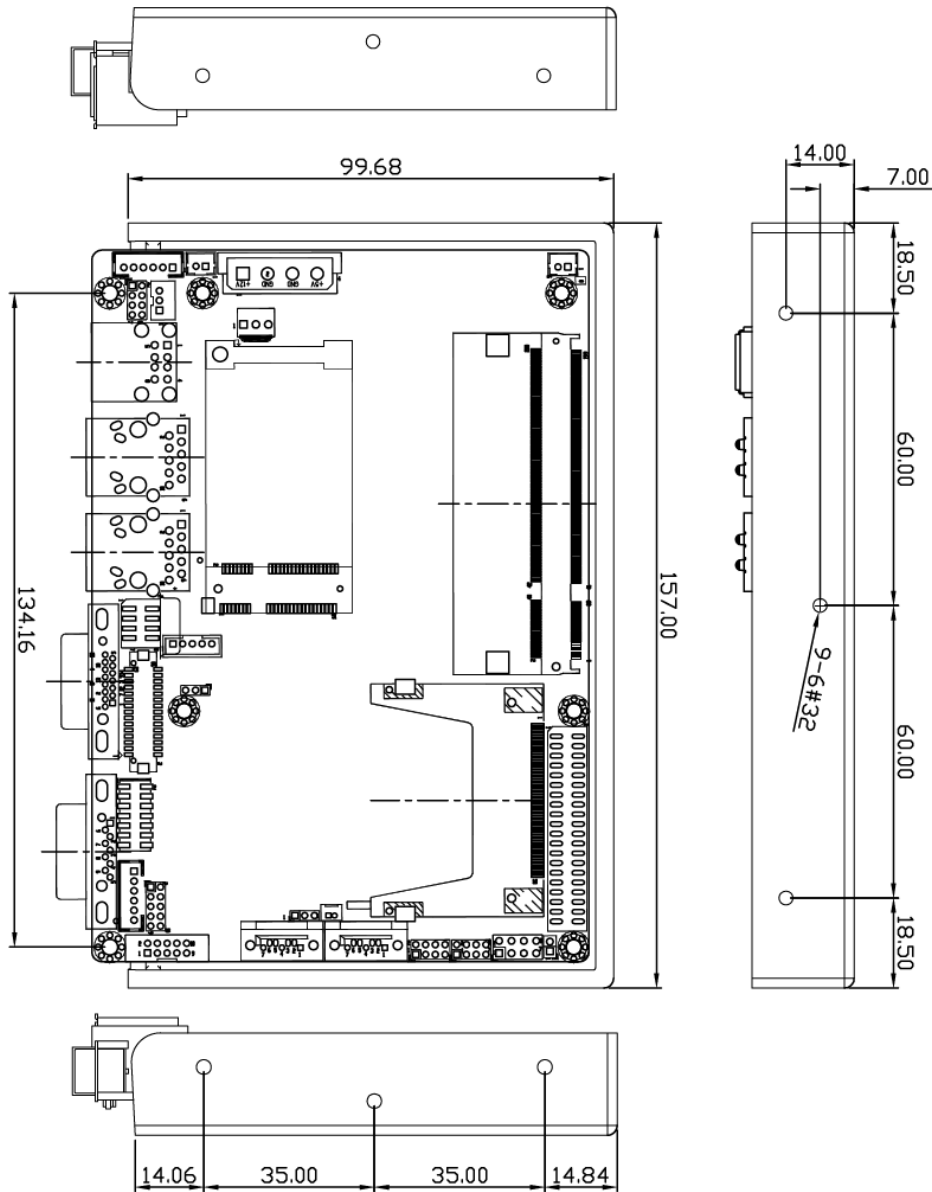
# Detailed Specifications

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## 2.1 Dimensions

### 2.1.1 Board Dimensions

The dimensions of the board are shown below:



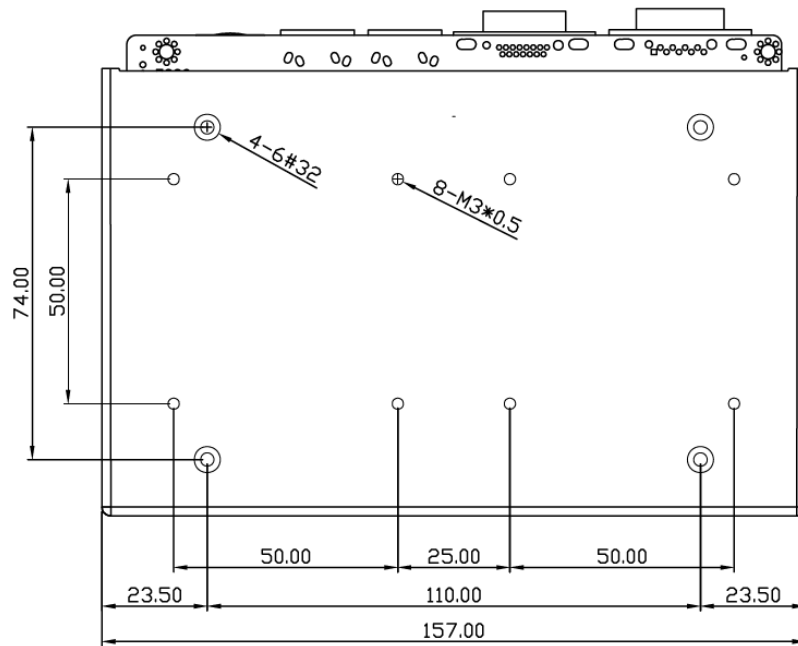


Figure 2-1: 3308480 Dimensions (mm)

## 2.1.2 External Interface Panel Dimensions

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

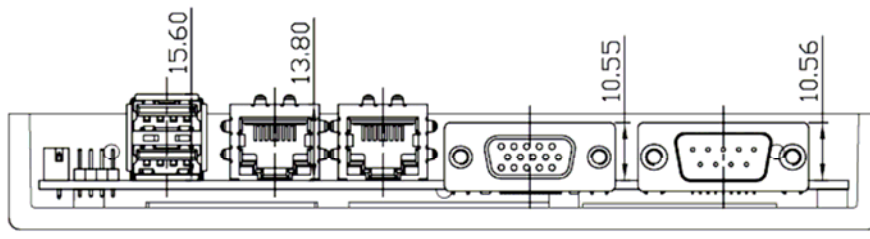


Figure 2-2: External Interface Panel Dimensions (mm)

## 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.

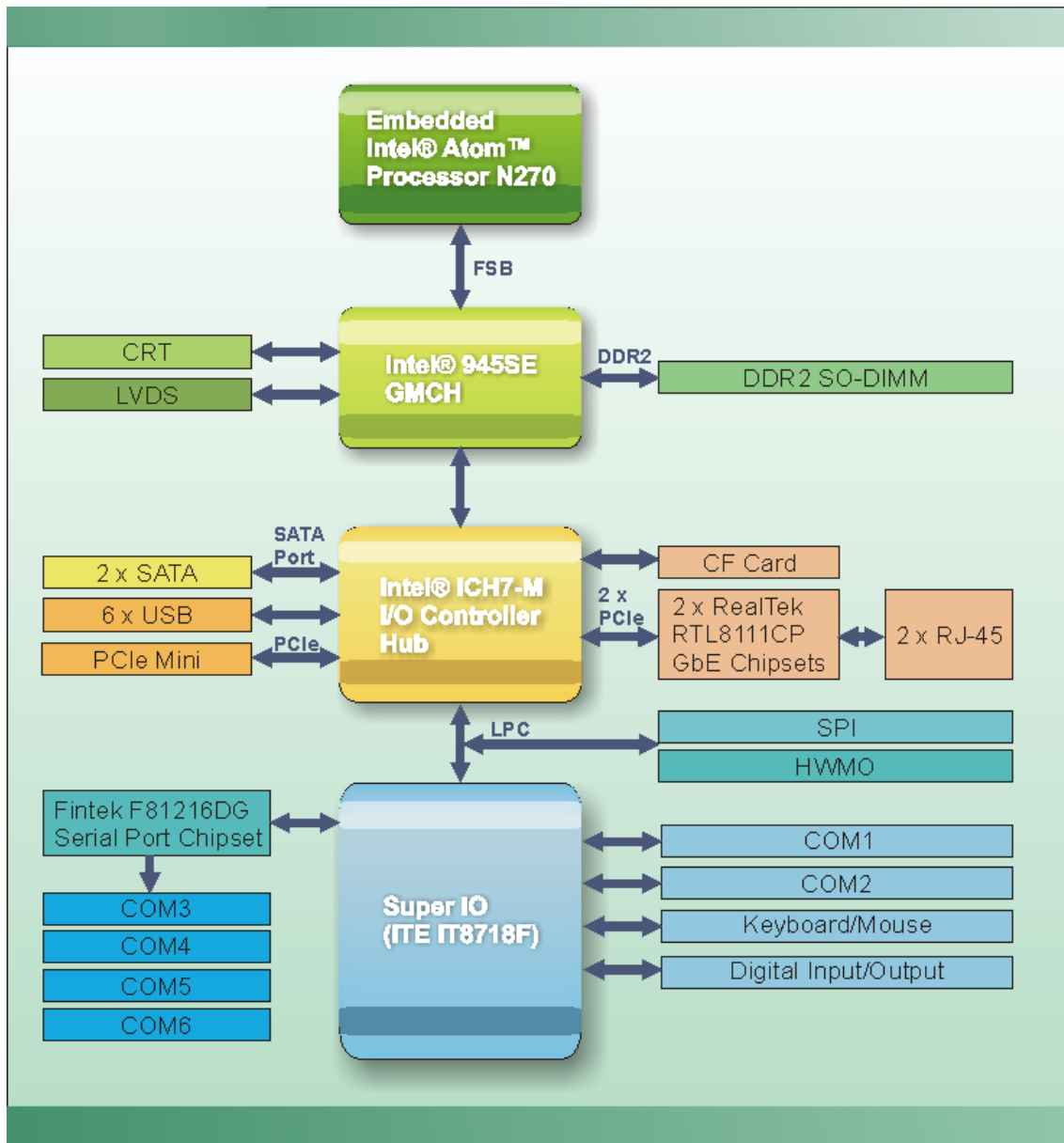


Figure 2-3: Data Flow Block Diagram

## 2.3 Embedded 3308480 Processor

### 2.3.1 Overview

The 3308480 comes with an embedded 45 nm 1.60 GHz Intel® Atom™ processor N270. The processor supports a 533 MHz FSB and has a 1.6 GHz 512 KB L2 cache. The

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low power processor has a maximum power of 2.5 W. The processor is covered with a heat sink and is shown in Figure 2-4 below.

### 45 nm 1.60 GHz Intel® Atom™ processor N270

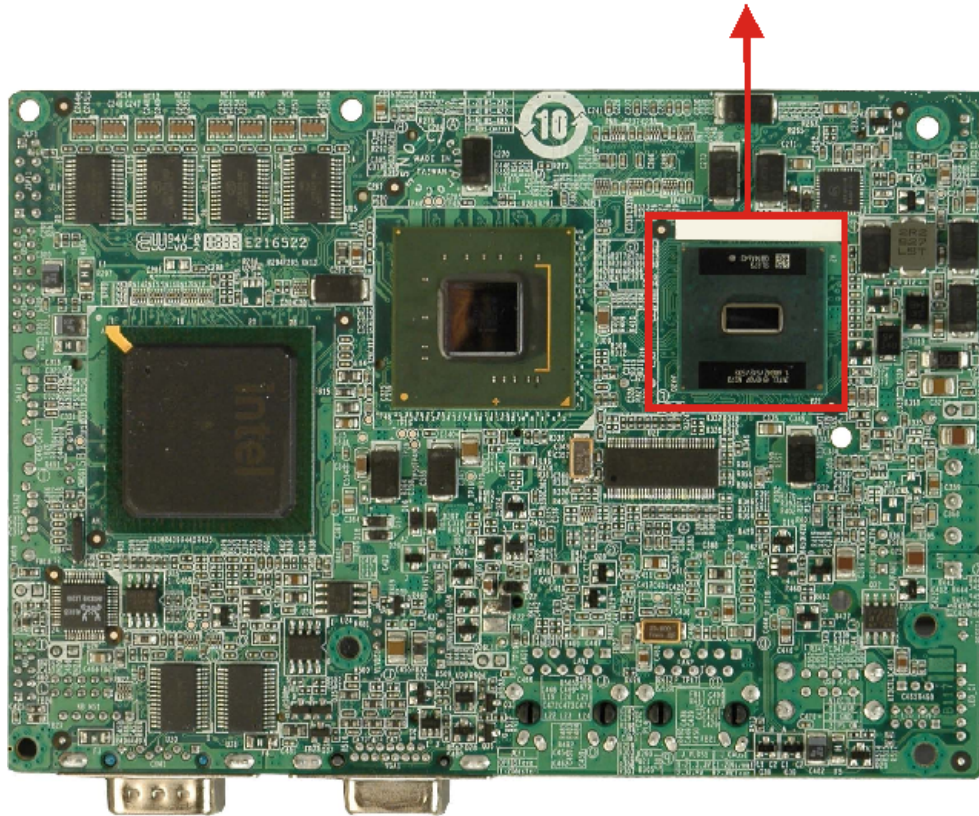


Figure 2-4: Embedded Processor

### 2.3.2 Features

Some of the features of the Intel® Atom™ processor 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 3308480 is interfaced to the Intel 945GSE Northbridge through a 533 MHz front side bus (FSB). The FSB is shown in **Figure 2-5** below.

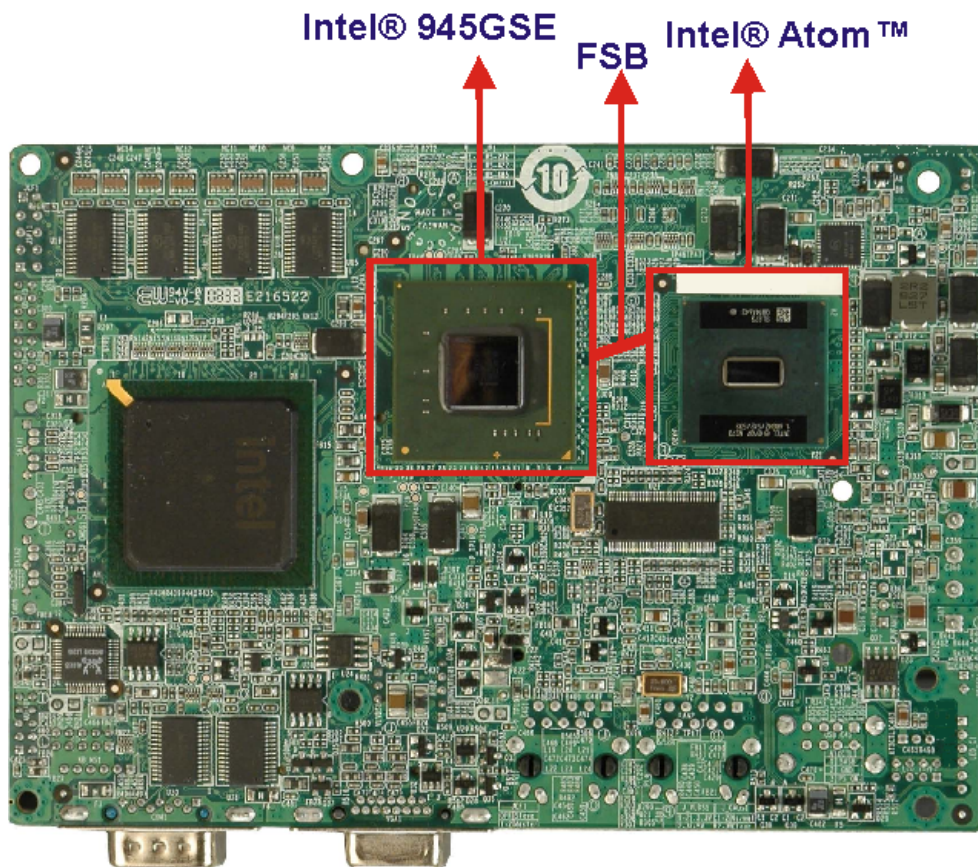


Figure 2-5: Front Side Bus



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## 2.4 Intel 945GSE Northbridge Chipset

### 2.4.1 Intel® 945GSE Overview

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.

### 2.4.2 Intel® 945GSE DDR2 Controller

There is one 200-pin DDR2 SO-DIMM socket on the 3308480. 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 2-6 below.

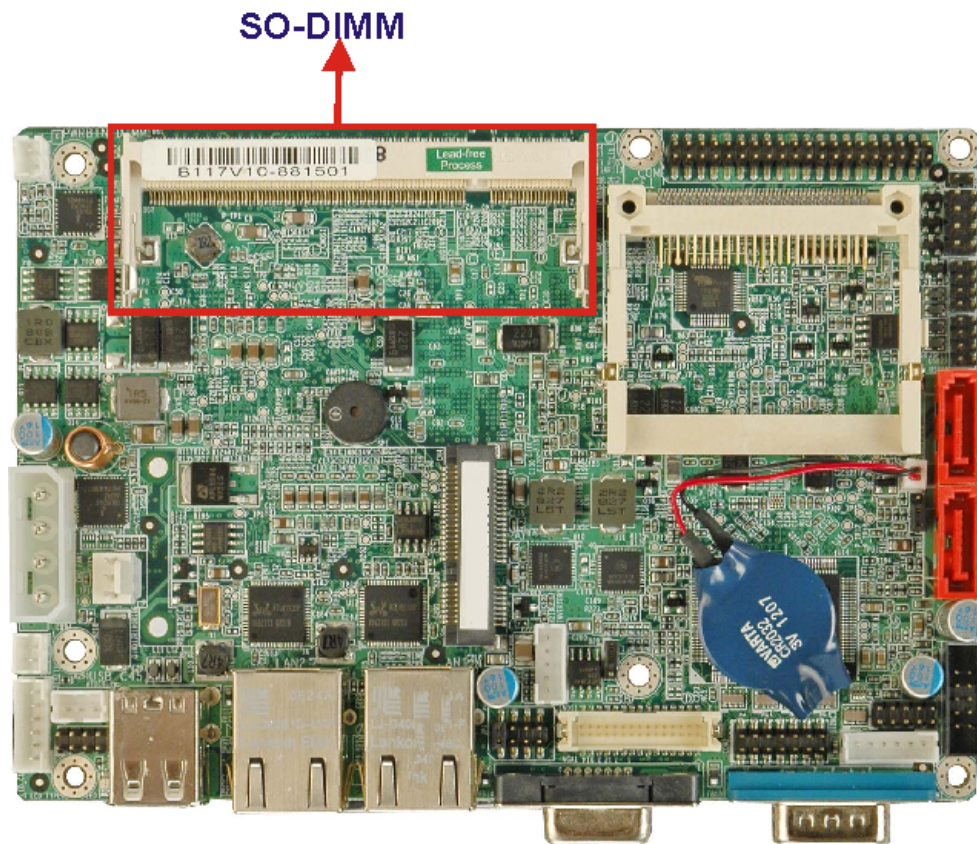


Figure 2-6: DDR2 SO-DIMM Socket

### 2.4.3 Intel® 945GSE Graphics

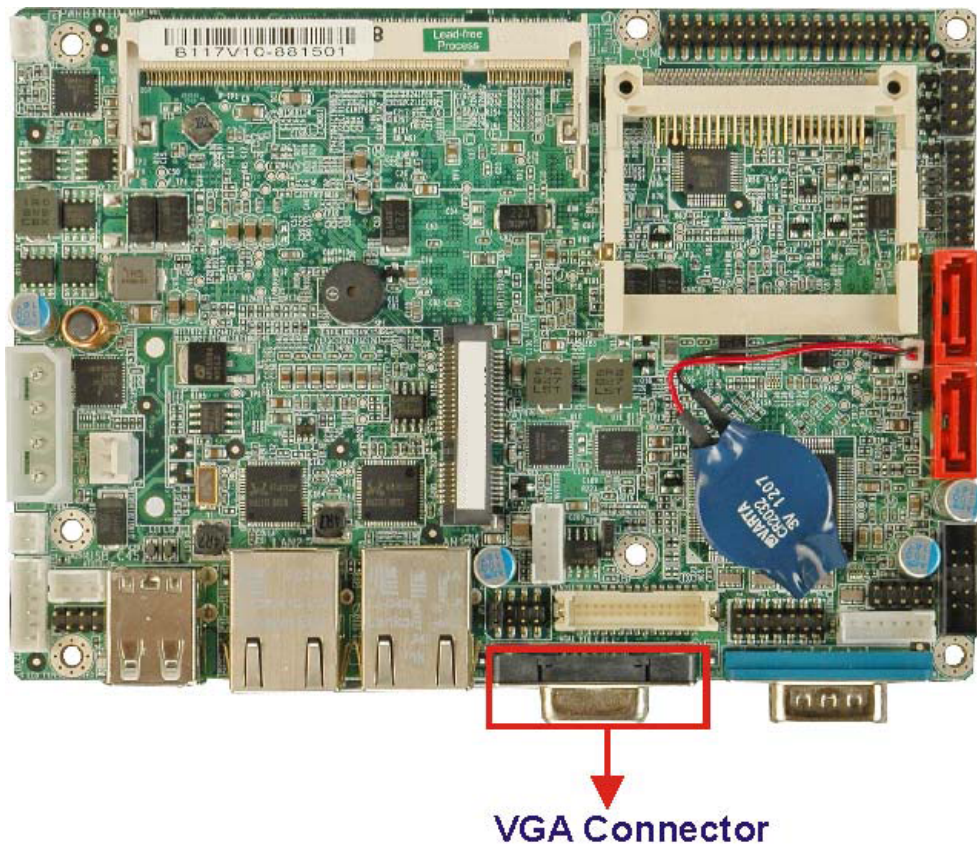
The Intel® 945GSE supports CRT and LVDS. The internal graphics engine has the following features:

- Intel® Gen 3.5 Integrated Graphics Engine
- 250-MHz core render clock and 200 MHz core display clock at 1.05-V core voltage
- Supports TV-Out, LVDS, CRT and SDVO
- Dynamic Video Memory Technology (DVMT 3.0)
- Intel® Display Power Saving Technology 2.0 (Intel® DPST 2.0)
- Intel® Smart 2D Display Technology (Intel® S2DDT)
- Intel® Automatic Display Brightness
- Video Capture via x1 concurrent PCIe port
- Concurrent operation of x1 PCIe and SDVO

- 4x pixel rate HVMC
- Microsoft DirectX\* 9.1 operating system
- Intermediate Z in Classic Rendering
- Internal Graphics Display Device States: D0, D1, D3
- Graphics Display Adapter States: D0, D3.

### 2.4.3.1 Analog CRT Graphics Mode

The analog CRT bus is interfaced to an external DB-15 interface connector. The connector is shown below.



**Figure 2-7: VGA Connector**

Some of the features of the CRT include:

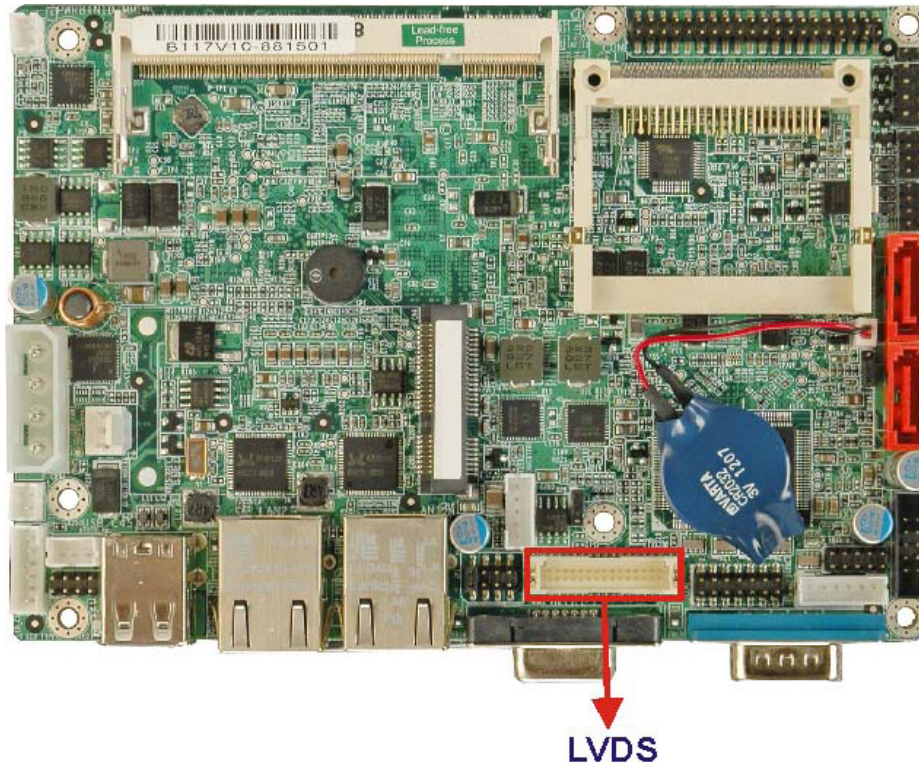
- Integrated 400-MHz RAMDAC
- Analog Monitor Support up to QXGA



- Support for CRT Hot Plug

### 2.4.3.2 LVDS Interface

The LVDS interface is connected directly to one of the LVDS connectors on the board.



**Figure 2-8: LVDS Connector**

Some of the features of the LVDS interface include:

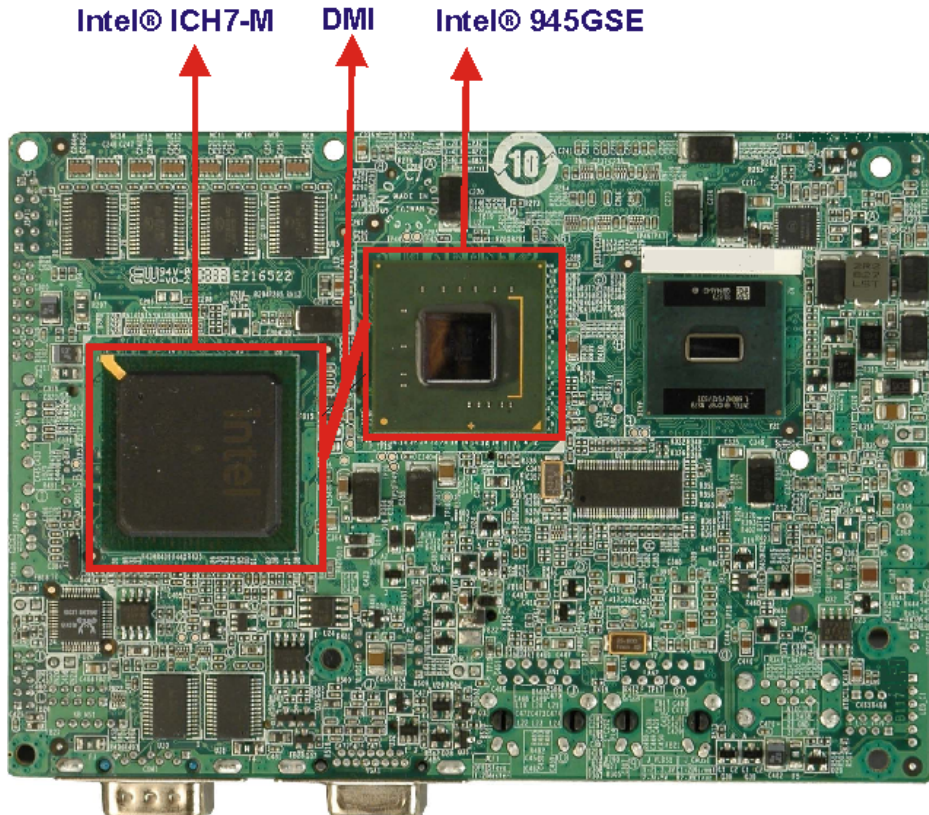
- Panel support up to UXGA (1600 x 1200)
- 25-MHz to 112-MHz single-/dual-channel; @18 bpp
  - TFT panel type supported
- Pixel Dithering for 18-bit TFT panel to emulate 24-bpp true color displays
- Panel Fitting, Panning, and Center Mode Supported
- CPIS 1.5 compliant
- Spread spectrum clocking supported
- Panel Power Sequencing support
- Integrated PWM interface for LCD backlight inverter control

---

## 2.5 Intel® ICH7-M Southbridge Chipset

### 2.5.1 Intel® ICH7-M Overview

The Intel® ICH7-M southbridge chipset is connected to the Intel® 945GSE northbridge GMCH through the chip-to-chip Direct Media Interface (DMI).



**Figure 2-9: Direct Media Interface**

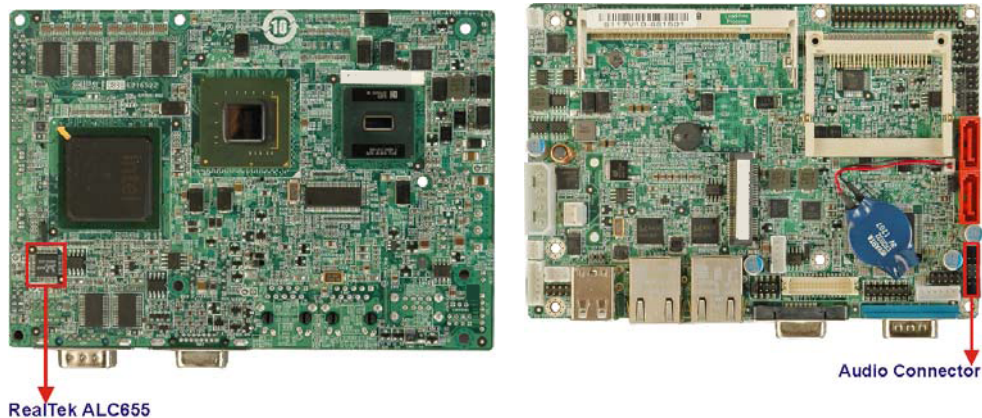
Some of the features of the Intel® ICH7-M are listed below.

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

- Interrupt controller
- Timer functions
- Integrated SATA host controller with DMA operations interfaced to four SATA connectors on the 3308480
- Integrated IDE controller supports Ultra ATA 100/66/33
- Supports the four USB 2.0 devices on the 3308480 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

## 2.5.2 Intel® ICH7-M Audio Codec '97 Controller

The Integrated AC'97 v2.3 compliant audio controller is integrated to a RealTek ALC655 audio codec. The RealTek ALC655 is in turn connected to onboard audio connectors, which are then connected to compliant audio devices. The RealTek ALC655 is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio codec. The codec and the audio connectors are shown in **Figure 2-10**.



**Figure 2-10: Audio Codec and Connectors**

Some of the features of the RealTek ALC655 are listed below:

- 
- Meets performance requirements for audio on PC99/2001 systems
  - Meets Microsoft WHQL/WLP 2.0 audio requirements
  - 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
  - Compliant with AC'97 Rev 2.3 specifications
    - Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
    - 14.318MHz -> 24.576MHz PLL to eliminate crystal
    - 12.288MHz BITCLK input
    - Integrated PCBEEP generator to save buzzer
    - Interrupt capability
  - Three analog line-level stereo inputs with 5-bit volume control, LINE\_IN, CD, AUX
  - High-quality differential CD input
  - Two analog line-level mono inputs: PCBEEP, PHONE-IN
  - Two software selectable MIC inputs
  - Dedicated Front-MIC input for front panel applications (software selectable)
  - Boost preamplifier for MIC input
  - LINE input shared with surround output; MIC input shared with Center and LFE output
  - Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
  - External Amplifier Power Down (EAPD) capability
  - Power management and enhanced power saving features
  - Supports Power-Off CD function
  - Adjustable VREFOUT control
  - Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
  - Supports 32K/44.1K/48KHz S/PDIF input
  - Power support: Digital: 3.3V; Analog: 3.3V/5V
  - Standard 48-pin LQFP package
  - EAX™ 1.0 & 2.0 compatible
  - Direct Sound 3D™ compatible
  - A3D™ compatible
  - I3DL2 compatible
  - HRTF 3D positional audio
  - 10-band software equalizer

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### **2.5.3 Intel® ICH7-M Low Pin Count (LPC) Interface**

The ICH7-M 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

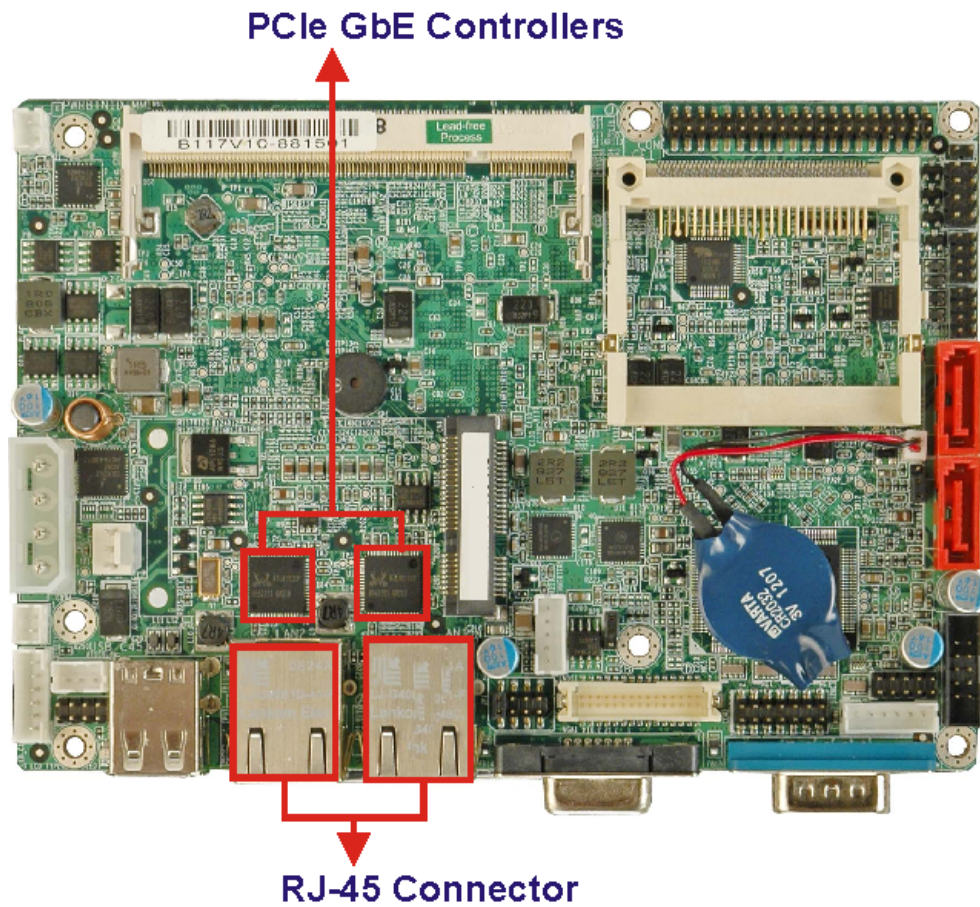
### **2.5.4 Intel® ICH7-M PCIe Bus**

The Intel® ICH7-M southbridge chipset has four PCIe lanes. Two of the four PCIe lanes are interfaced to PCIe GbE controller. A third PCIe lane is interfaced to a PCIe mini socket.

#### **2.5.4.1 PCIe GbE Ethernet**

Two PCIe lanes are connected to two Realtek RTL8111C PCIe GbE controllers shown in Figure 2-11 below.





**Figure 2-11: Realtek RTL8111C PCIe 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 (10Mbps 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.

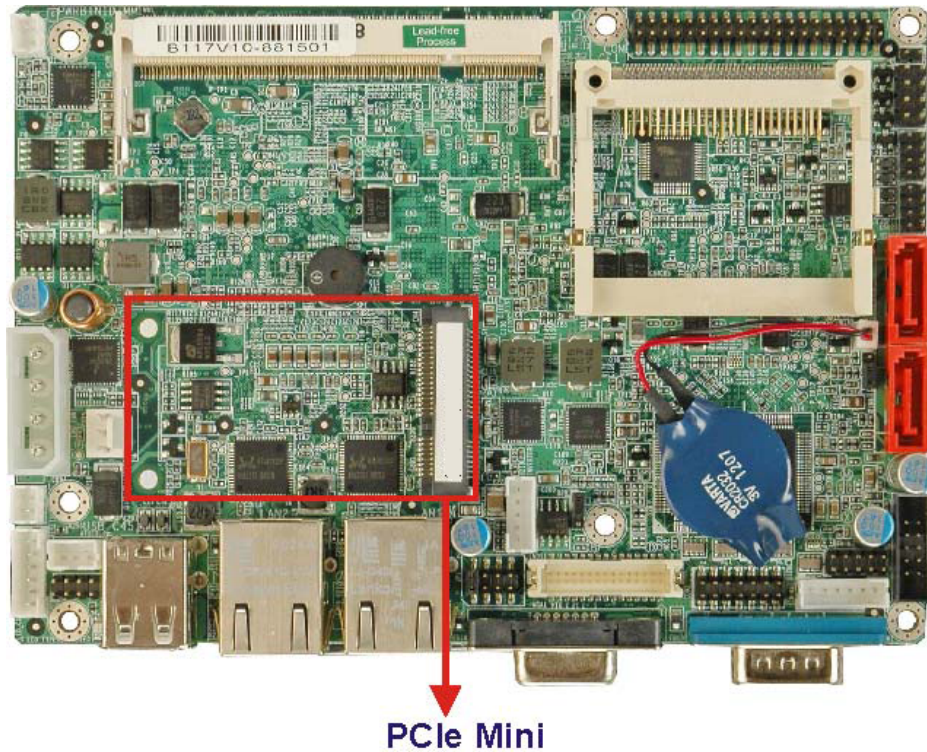
Some of the features of the Realtek RTL8111C PCIe GbE controllers are listed below.

- 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)

#### **2.5.4.2 PCIe Mini Expansion Slot**

One PCIe x1 port and one USB 2.0 port on the ICH7M is interfaced directly to a PCIe mini expansion slot. This enables the addition of PCIe mini expansion devices. The PCIe mini slot is shown in Figure 2-12.



**Figure 2-12: PCIe Mini Slot**

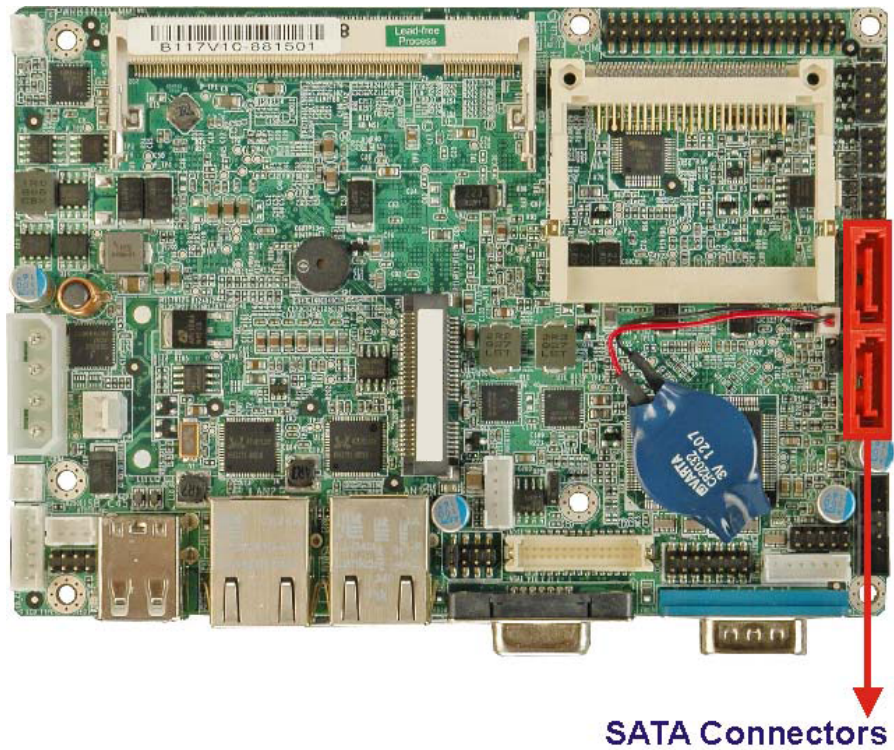
### **2.5.5 Intel® ICH7-M Real Time Clock**

256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH6. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

### **2.5.6 Intel® ICH7-M SATA Controller**

The integrated SATA controller on the ICH7-M southbridge supports up to four SATA drives with independent DMA operations. Two SATA controllers are connected to two SATA connectors on the 3308480. The SATA connectors are shown in Figure 2-13.





**Figure 2-13: SATA Connectors**

SATA controller specifications are listed below.

- Supports four SATA drives
- Supports 1.5 Gb/s data transfer speeds
- Supports Serial ATA Specification, Revision 1.0a

### **2.5.7 Intel® ICH7-M USB Controller**

Up to six high-speed, full-speed or low-speed USB devices are supported by the ICH7-M on the 3308480. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH7-M integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the ICH7-M integrated Universal Host Controller Interface (UHCI) controllers.

The six USB ports implemented on the 3308480 are connected to two internal connectors and one external connector. See **Figure 2-14**.

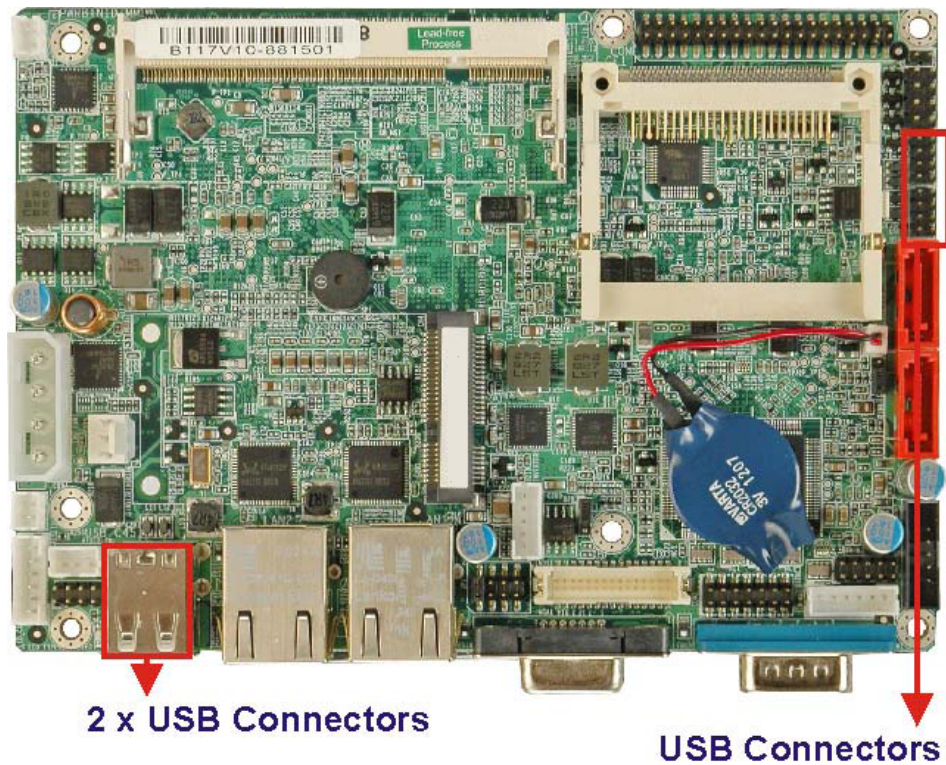


Figure 2-14: Onboard USB Implementation

## 2.6 LPC Bus Components

### 2.6.1 LPC Bus Overview

The SIS964 LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset
- LPC Serial Port Chipset

### 2.6.2 BIOS Chipset

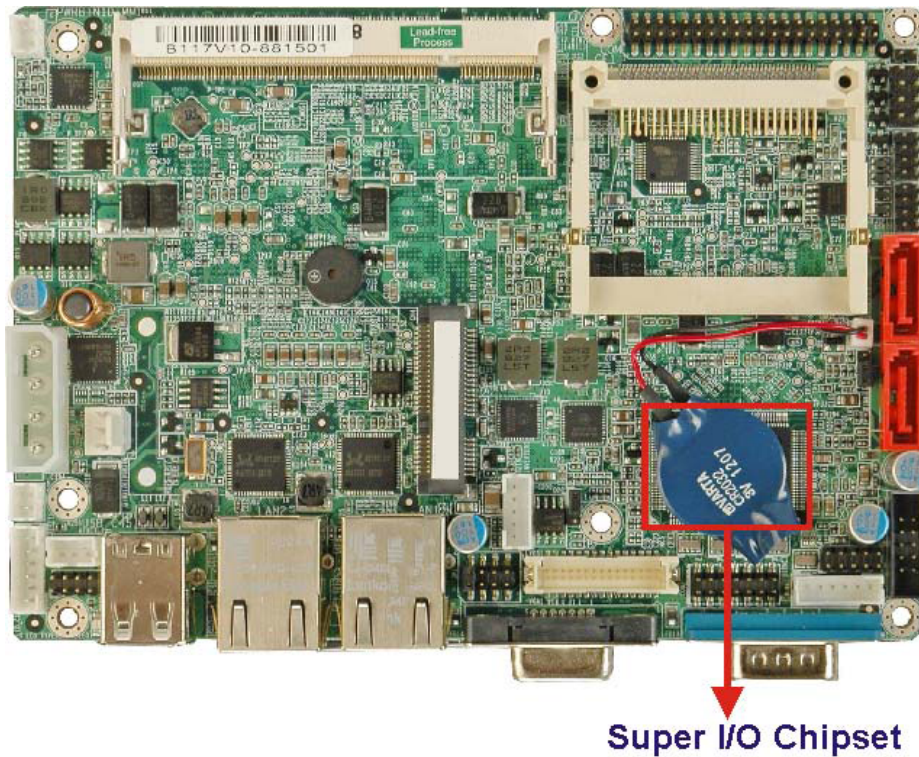
The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant

- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

### 2.6.3 iTE IT8718F Super I/O chipset

The iTE IT8718F Super I/O chipset is connected to the ICH7-M southbridge through the LPC bus.



**Figure 2-15: Super I/O**

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:

### **2.6.3.1 Super I/O LPC Interface**

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. 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)
- IrDa 1.0 and ASKIR protocols

Another chipset connected to the LPC bus provided connectivity to another two serial port connectors (COM3 and COM4).

### **2.6.3.3 Super I/O 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.

### **2.6.3.4 Super I/O 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.

---

### 2.6.3.5 Super I/O 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.

### 2.6.3.6 Super I/O 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

## 2.6.4 Fintek F81216DG LPC Serial Port Chipset

The Fintek F81216DG chipset 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

## 2.7 Environmental and Power Specifications

### 2.7.1 System Monitoring

Two thermal inputs on the 3308480 Super I/O Enhanced Hardware Monitor monitor the following temperatures:



- 
- System temperature
  - CPU temperature

Eight voltage inputs on the 3308480 Super I/O Enhanced Hardware Monitor monitor the following voltages:

- CPU Core
- +1.05V
- +3.3V
- +12V
- +1.5V
- +1.8V
- +5VSB
- VBAT

The 3308480 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan speed

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 3308480 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 2-1** shows the power consumption parameters for the 3308480 running with a 1.6 GHz Intel® Atom™ with 1.0 GB DDR2 memory.

Voltage	Current
+5V	2.94A

**Table 2-1: Power Consumption**

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Chapter

3

# Unpacking

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## 3.1 Anti-static Precautions

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### WARNING!

Failure to take ESD precautions during the installation of the 3308480 may result in permanent damage to the 3308480 and severe injury to the user.

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Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3308480. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 3308480, 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 3308480, place it on an anti-static pad. This reduces the possibility of ESD damaging the 3308480.
- **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 3308480 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 3308480 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.





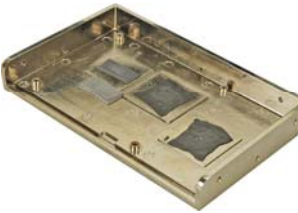
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## 3.3 Unpacking Checklist

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### 3.3.1 Package Contents





The 3308480 is shipped with the following components:

Quantity	Item and Part Number	Image
1	3308480	
2	SATA cable	
1	KB/MS Cable	
1	Audio cable	
1	Enclosure heat sink	

1	4 COM (wo bracket)	
1	Mini jumper pack (2.0mm)	
1	Utility CD	
1	Quick Installation Guide	

### 3.3.2 Optional Items

The 3308480 is shipped with the following components:

Item and Part Number	Image
Dual USB cable (wo bracket)	
RS-232/422/485 cable	
ATX cable	
SATA power cable	



---

4 COM (w bracket)



---

Chapter

4

# Connectors

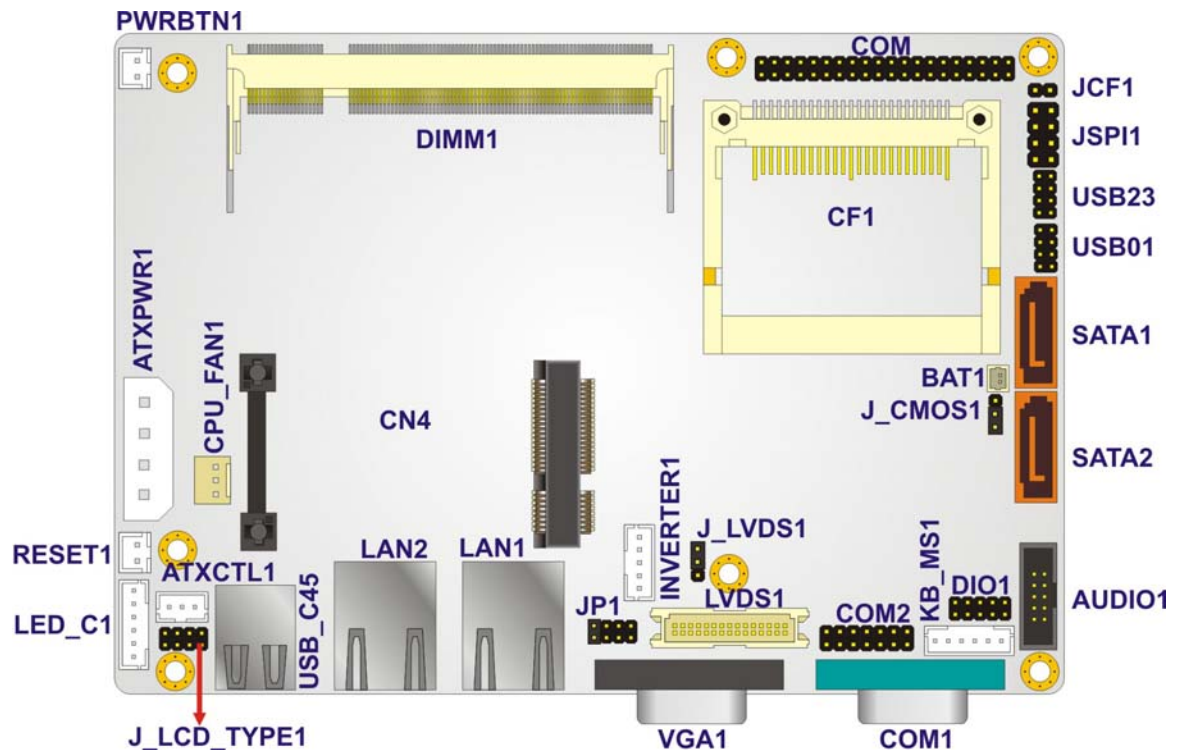
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## 4.1 Peripheral Interface Connectors

Section 4.2 shows peripheral interface connector locations. Section 4.2 lists all the peripheral interface connectors seen in Section 4.2.

### 4.1.1 33084803308480 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]**

## 4.2 Peripheral Interface Connectors

**Table 4-1** shows a list of the peripheral interface connectors on the 3308480.

Detailed descriptions of these connectors can be found below.

Connector	Type	Label
Audio connector	10-pin header	AUDIO1
ATX enable connector	3-pin wafer	ATXCTL1
ATX power connector	4-pin ATX	ATXPWR1
Backlight inverter connectors	5-pin wafer	INVERTER1
CompactFlash® socket	50-pin CF socket	CF1
Digital input/output (DIO) connector	10-pin header	DIO1
Fan connector	3-pin wafer	CPU_FAN1
Keyboard and mouse connector	6-pin wafer	KB_MS1
LED connector	6-pin header	LED_C1
LVDS connector	30-pin crimp	LVDS1
PCIe Mini Card slot	PCIe Mini Slot	CN4
Power Button	2-pin wafer	PWRBTN1
Reset button connector	2-pin header	RESET1
Serial ATA (SATA) drive connectors	7-pin SATA	SATA1
Serial ATA (SATA) drive connectors	7-pin SATA	SATA2
RS-232 serial port connector (COM3 – COM6)	40-pin header	COM
RS-232/422/485 serial port connector	14-pin header	COM2
USB 2.0 connector	8-pin header	USB01
USB 2.0 connector	8-pin header	USB23

**Table 4-1: Peripheral Interface Connectors**

#### 4.2.1 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the 3308480. Detailed descriptions of these connectors can be found in **Section 4.4** on **page 58**.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
RS-232 serial port connector	Male DB-9	COM1
Dual USB port	USB port	USB_C45
VGA port connector	15-pin female	VGA1

**Table 4-2: Rear Panel Connectors**

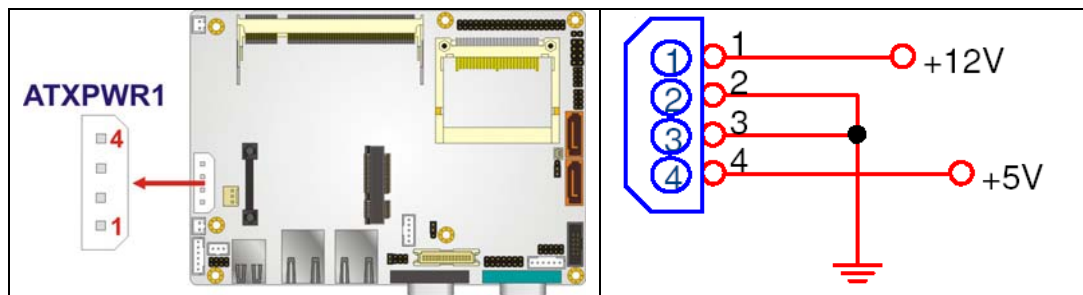
## 4.3 Internal Peripheral Connectors

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 3308480.

### 4.3.1 ATX Power Connector

- CN Label:**        **ATXPWR1**
- CN Type:**         4-pin AT power connector (1x4)
- CN Location:**    See **Figure 4-2**
- CN Pinouts:**     See **Table 4-3**

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



**Figure 4-2: ATX Power Connector Location**

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

Table 4-3: ATX Power Connector Pinouts

### 4.3.2 ATX Power Supply Enable Connector

- CN Label:** ATXCTL1
- CN Type:** 3-pin wafer (1x3)
- CN Location:** See Figure 4-3
- CN Pinouts:** See Table 4-4

The ATX power supply enable connector enables the 3308480 to be connected to an ATX power supply. In default mode, the 3308480 can only use an AT power supply. To enable an ATX power supply the AT Power Select jumper must also be configured. Please refer to Chapter 3 for more details.

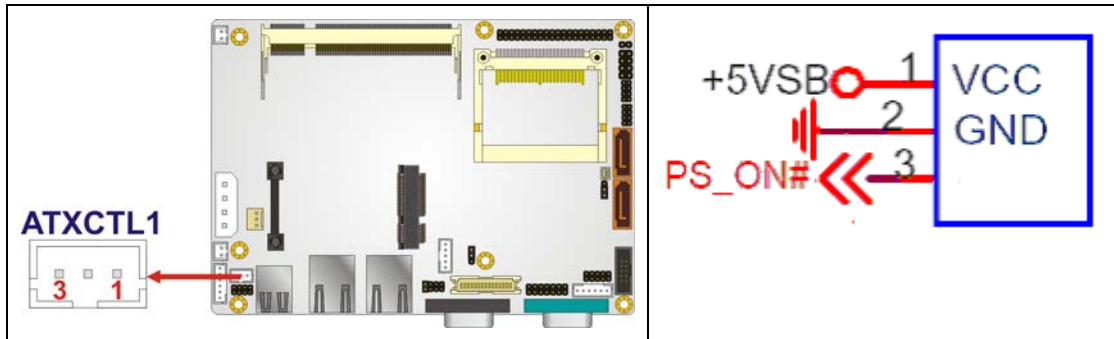


Figure 4-3: ATX Power Supply Enable Connector Location

PIN NO.	DESCRIPTION
1	+5V Standby
2	GND



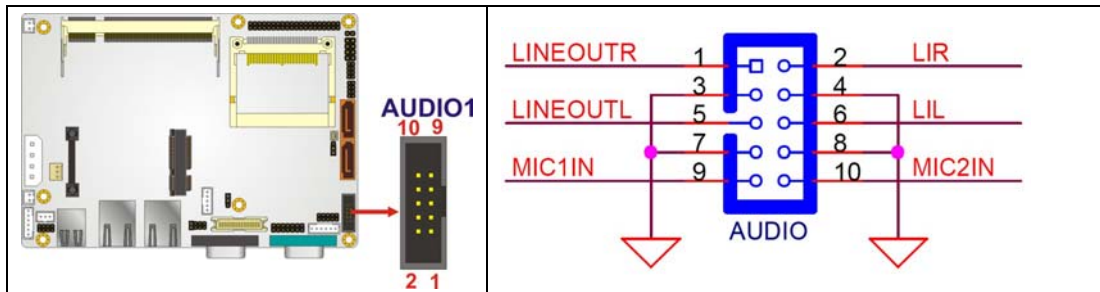
3	PS-ON
---	-------

**Table 4-4: ATX Power Supply Enable Connector Pinouts**

### 4.3.3 Audio Connector (10-pin)

- CN Label:** AUDIO1
- CN Type:** 10-pin header
- CN Location:** See Figure 4-4
- CN Pinouts:** See Table 4-5

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.



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

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

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

### 4.3.4 Backlight Inverter Connector

- CN Label:** INVERTER1
- CN Type:** 5-pin wafer (1x5)
- CN Location:** See Figure 4-5
- CN Pinouts:** See Table 4-6

The backlight inverter connectors provide the backlights on the LCD display connected to the 3308480 with +12V of power.

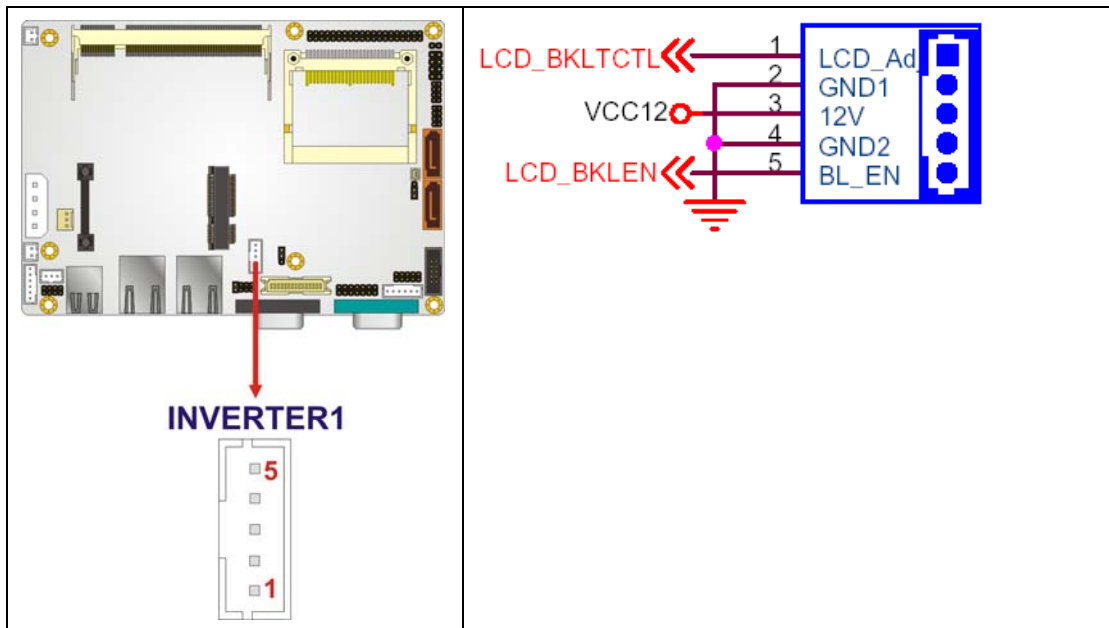


Figure 4-5: Panel Backlight Connector Pinout Locations

PIN NO.	DESCRIPTION
1	LCD Backlight Control
2	GROUND
3	+12V
4	GROUND
5	BACKLIGHT Enable

Table 4-6: Panel Backlight Connector Pinouts

### 4.3.5 CompactFlash® Socket

- CN Label:** CF1
- CN Type:** 50-pin header (2x25)
- CN Location:** See Figure 4-6
- CN Pinouts:** See Table 4-7

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the 3308480.

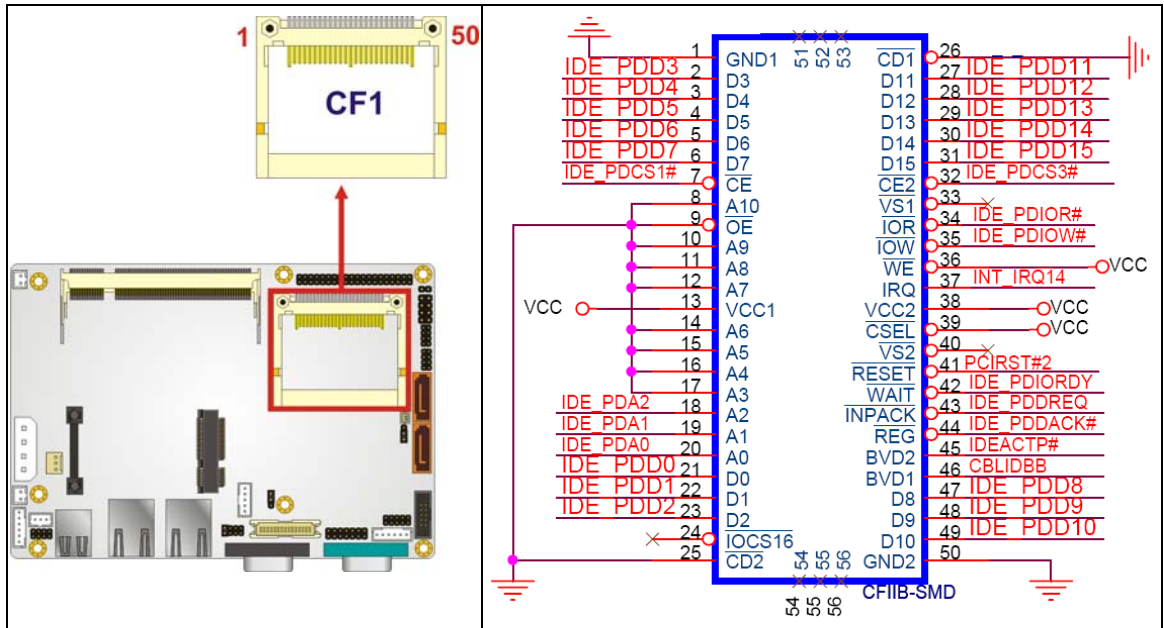


Figure 4-6: CF Card Socket Location

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

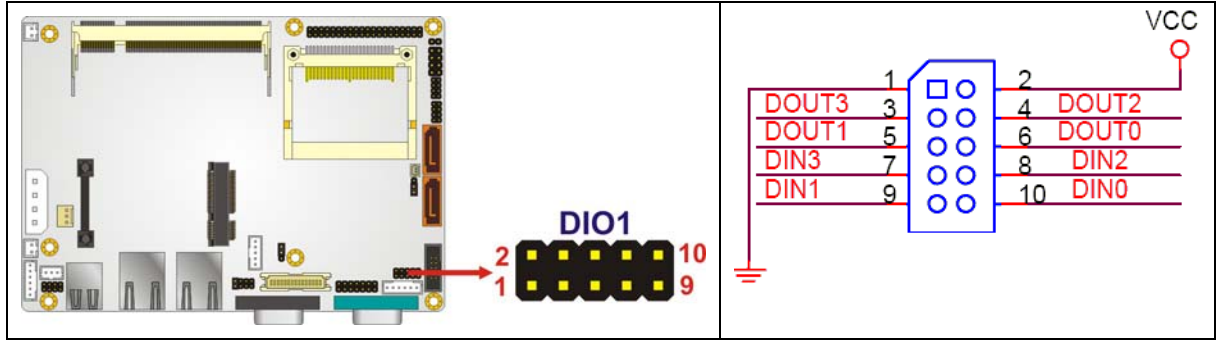
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
7	HDC_CS0#	32	HDC_CS1
8	GROUND	33	N/C
9	GROUND	34	IOR#
10	GROUND	35	IOW#
11	GROUND	36	VCC_COM
12	GROUND	37	IRQ14
13	VCC_COM	38	VCC_COM
14	GROUND	39	CSEL
15	GROUND	40	N/C
16	GROUND	41	HDD_RESET
17	GROUND	42	IORDY
18	SA2	43	SDREQ
19	SA1	44	SDACK#
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	66DET
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

**Table 4-7: CF Card Socket Pinouts**

#### 4.3.6 Digital Input/Output (DIO) Connector

- CN Label:** DIO1
- CN Type:** 10-pin header (2x5)
- CN Location:** See Figure 4-7
- CN Pinouts:** See Table 4-8

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



**Figure 4-7: DIO Connector Connector Locations**

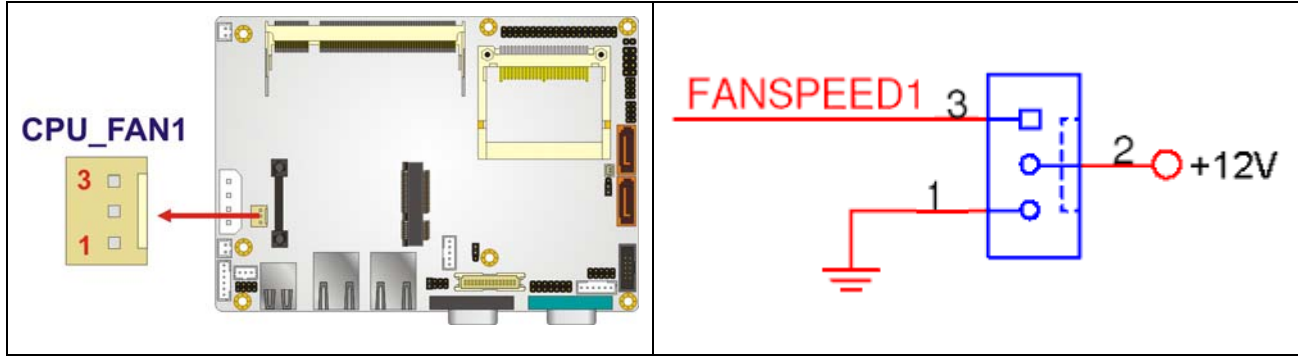
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

**Table 4-8: DIO Connector Connector Pinouts**

#### 4.3.7 Fan Connector (+12V, 3-pin)

- CN Label:** CPU\_FAN1
- CN Type:** 3-pin header
- CN Location:** See Figure 4-8
- CN Pinouts:** See Table 4-9

The cooling fan connector provides a 12V, 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 4-8: +12V Fan Connector Location**

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

**Table 4-9: +12V Fan Connector Pinouts**

### 4.3.8 Keyboard/Mouse Connector

- CN Label:** KB\_MS1
- CN Type:** 6-pin header (1x6)
- CN Location:** See **Figure 4-9**
- CN Pinouts:** See **Table 4-10**

The keyboard and mouse connector can be connected to a standard PS/2 cable or PS/2 Y-cable to add keyboard and mouse functionality to the system.



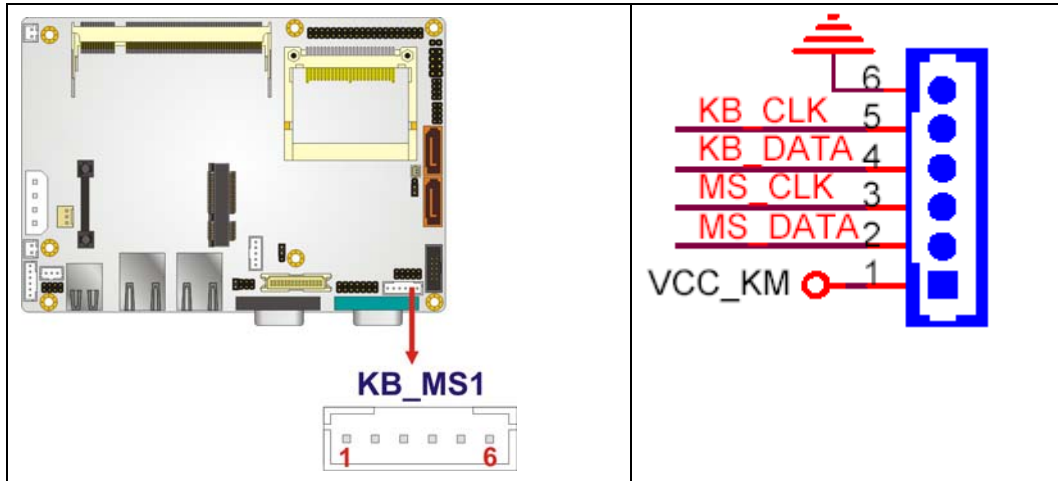


Figure 4-9: Keyboard/Mouse Connector Location

PIN NO.	DESCRIPTION
1	+5V KB DATA
2	MS DATA
3	MS CLK
4	KB DATA
5	KB CLK
6	GROUND

Table 4-10: Keyboard/Mouse Connector Pinouts

#### 4.3.9 LED Connector

- CN Label:** LED\_C1
- CN Type:** 6-pin wafer (1x6)
- CN Location:** See Figure 4-10
- CN Pinouts:** See Table 4-11

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

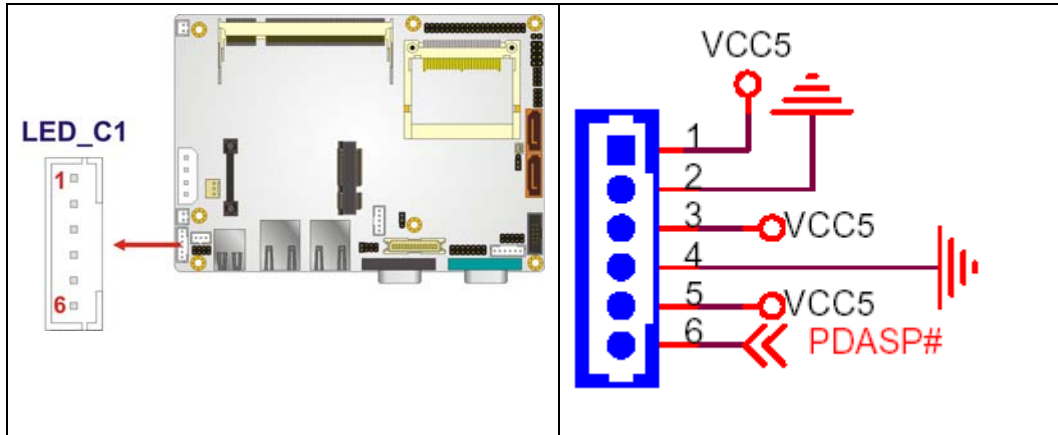


Figure 4-10: LED Connector Locations

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

Table 4-11: LED Connector Pinouts

#### 4.3.10 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, 24-bit or 36-bit LVDS panel.

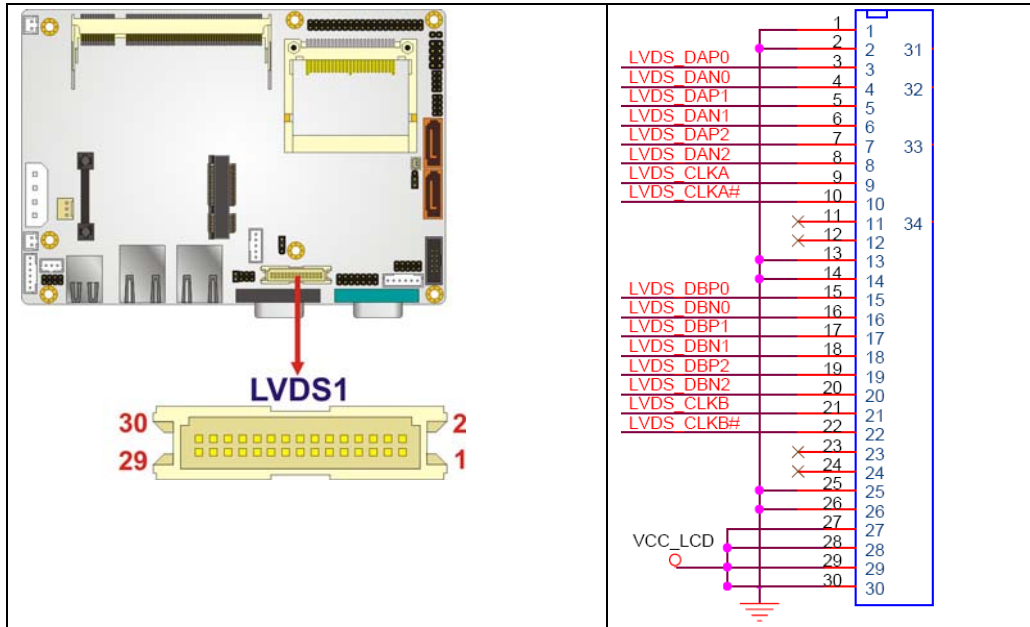


Figure 4-11: LVDS LCD Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND1	2	GND2
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	NC	12	NC
13	GND3	14	GND4
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	NC	24	NC
25	GND5	26	GND6
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

Table 4-12: LVDS LCD Port Connector Pinouts

### 4.3.11 PCIe Mini Card Slot

- CN Label:** CN4
- 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.

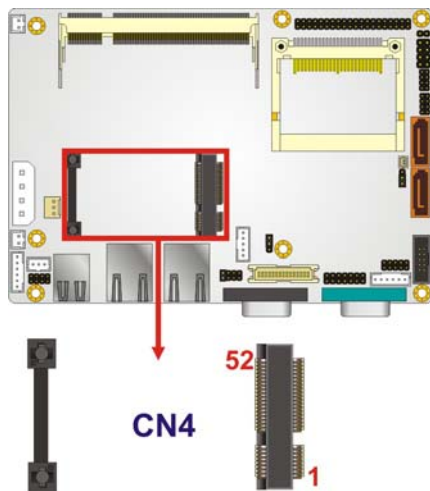


Figure 4-12: PCIe Mini Card Slot Location

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

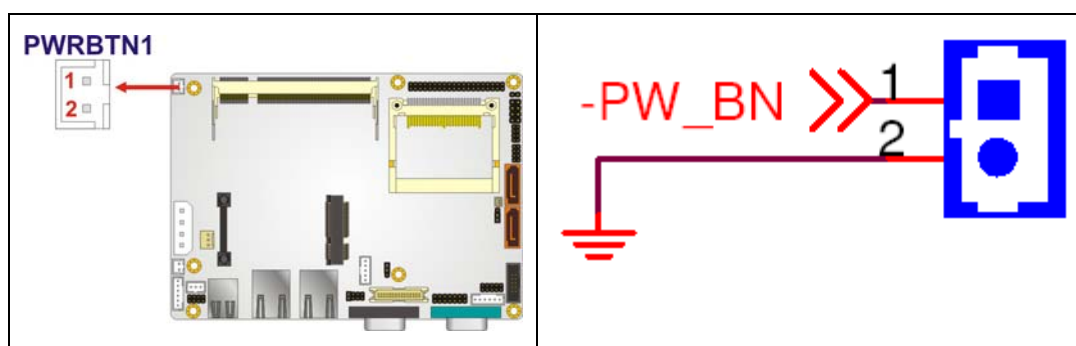
17	PCIRST#	18	GND
19	LPC	20	VCC3
21	GND	22	PCIRST#
23	PERN2	24	3VDual
25	PERP2	26	GND
27	GND	28	1.5V
29	GND	30	SMBCLK
31	PETN2	32	SMBDATA
33	PETP2	34	GND
35	GND	36	USB-
37	N/C	38	USB+
39	N/C	40	GND
41	N/C	42	N/C
43	N/C	44	RF_LINK#
45	N/C	46	BLUELED#
47	N/C	48	1.5V
49	N/C	50	GND
51	N/C	52	VCC3

**Table 4-13: PCIe Mini Card Slot Pinouts**

### 4.3.12 Power Button Connector

- CN Label:** PWRBTN1
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See **Figure 4-13**
- CN Pinouts:** See **Table 4-14**

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



**Figure 4-13: Power Button Connector Location**

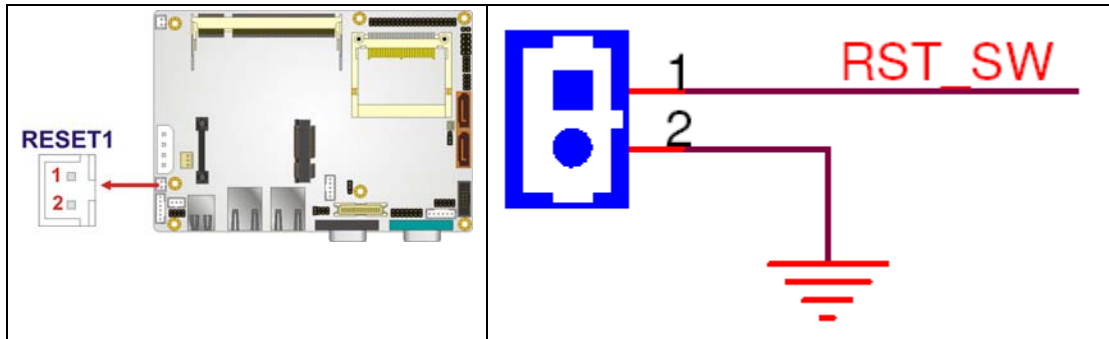
PIN NO.	DESCRIPTION
1	Power Switch
2	GND

**Table 4-14: Power Button Connector Pinouts**

### 4.3.13 Reset Button Connector

- CN Label:** RESET1
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See **Figure 4-14**
- CN Pinouts:** See **Table 4-15**

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



**Figure 4-14: Reset Button Connector Locations**

PIN NO.	DESCRIPTION
1	Reset Switch
2	GND

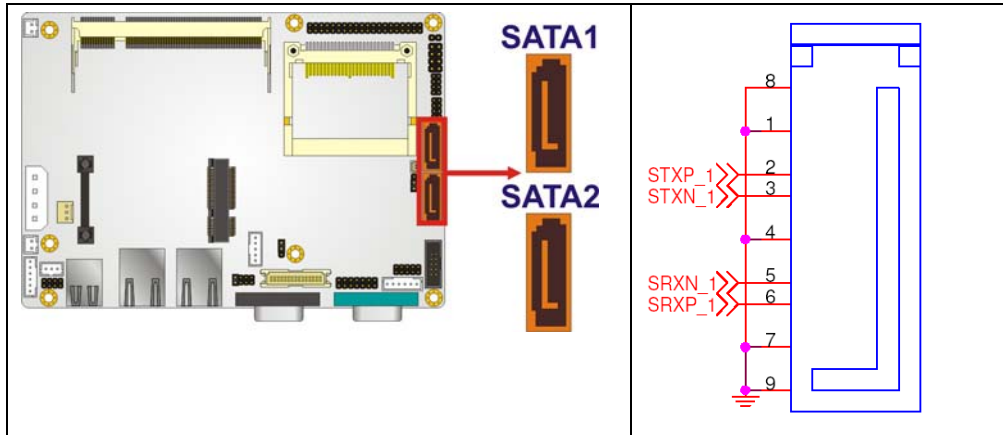
**Table 4-15: Reset Button Connector Pinouts**

#### 4.3.14 SATA Drive Connectors

- CN Label:** SATA1, SATA2
- CN Type:** 7-pin SATA drive connectors
- CN Location:** See Figure 4-15
- CN Pinouts:** See Table 4-16

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 150Mb/s. The SATA drives can be configured in a RAID configuration.





**Figure 4-15: SATA Drive Connector Locations**

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

**Table 4-16: SATA Drive Connector Pinouts**

#### 4.3.15 Serial Port Connector (COM3, COM4, COM5 and COM6)

- CN Label:** COM
- CN Type:** 40-pin header (2x20)
- CN Location:** See Figure 4-16
- CN Pinouts:** See Table 4-17

The 40-pin serial port connector contains the following four serial ports: COM3, COM4, COM5 and COM6. All these serial ports are RS-232 serial communications channels. The serial port locations are specified below.

- COM3 is located on pin 1 to pin 10
- COM4 is located on pin 11 to pin 20
- COM5 is located on pin 21 to pin 30
- COM6 is located on pin 31 to pin 40

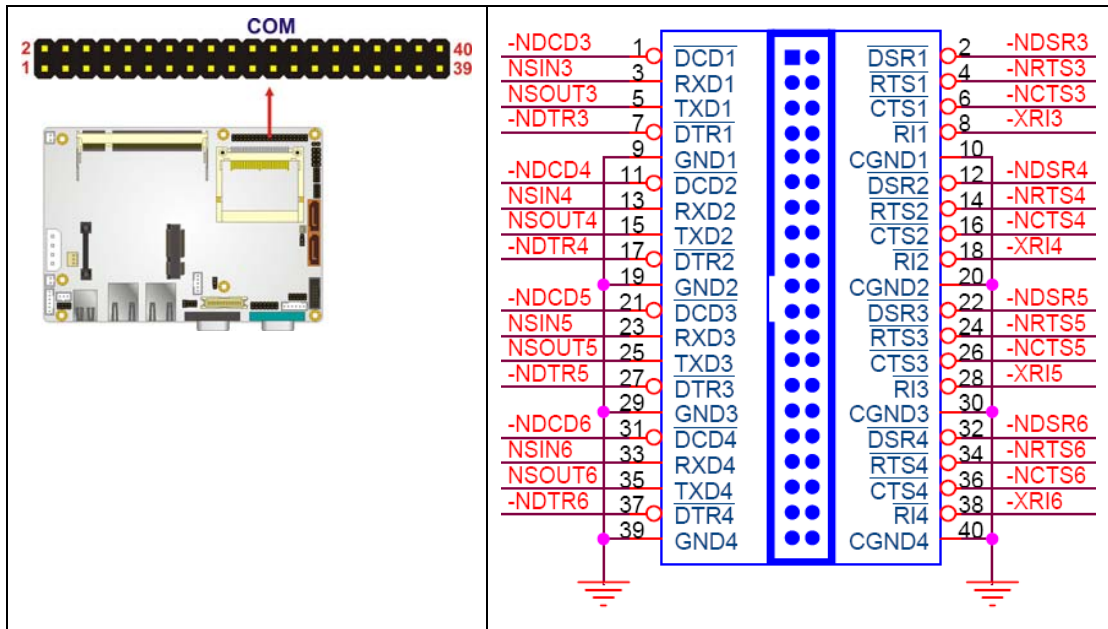


Figure 4-16: COM3 to COM6 Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD3)	2	DATA SET READY (DSR3)
3	RECEIVE DATA (RXD3)	4	REQUEST TO SEND (RTS3)
5	TRANSMIT DATA (TXD3)	6	CLEAR TO SEND (CTS3)
7	DATA TERMINAL READY (DTR3)	8	RING INDICATOR (RI3)
9	GND	10	GND
11	DATA CARRIER DETECT (DCD4)	12	DATA SET READY (DSR4)
13	RECEIVE DATA (RXD4)	14	REQUEST TO SEND (RTS4)
15	TRANSMIT DATA (TXD4)	16	CLEAR TO SEND (CTS4)
17	DATA TERMINAL READY (DTR4)	18	RING INDICATOR (RI4)
19	GND	20	GND
21	DATA CARRIER DETECT (DCD5)	22	DATA SET READY (DSR5)
23	RECEIVE DATA (RXD5)	24	REQUEST TO SEND (RTS5)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
25	TRANSMIT DATA (TXD5)	26	CLEAR TO SEND (CTS5)
27	DATA TERMINAL READY (DTR5)	28	RING INDICATOR (RI5)
29	GND	30	GND
31	DATA CARRIER DETECT (DCD6)	32	DATA SET READY (DSR6)
33	RECEIVE DATA (RXD6)	34	REQUEST TO SEND (RTS6)
35	TRANSMIT DATA (TXD6)	36	CLEAR TO SEND (CTS6)
37	DATA TERMINAL READY (DTR6)	38	RING INDICATOR (RI6)
39	GND	40	GND

**Table 4-17: COM3 to COM6 Connector Pinouts**

#### **4.3.16 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 4-17
- CN Pinouts:** See Table 4-18

The 14-pin serial port connector connects to the COM2 serial communications channels. COM2 is a multi function channel. In default mode COM2 is an RS-232 serial communication channel but, with the COM2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.

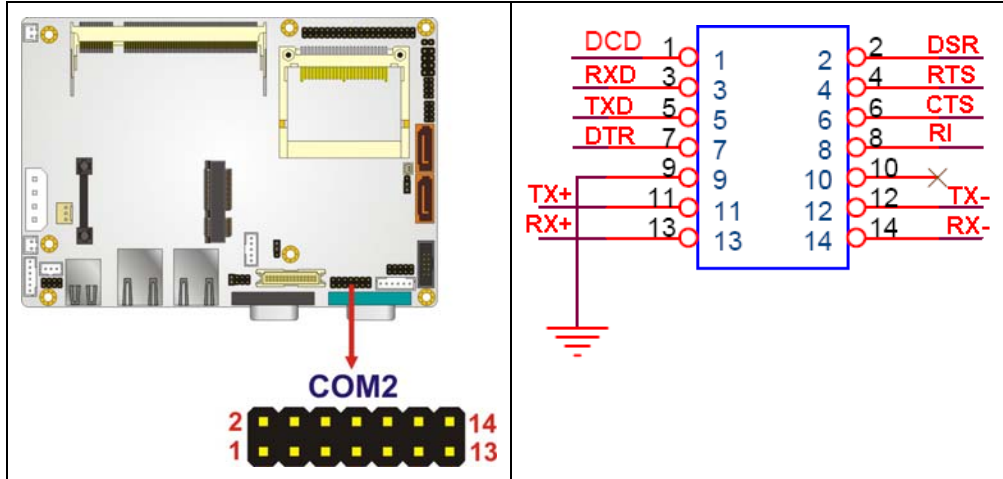


Figure 4-17: RS-232/422/485 Serial Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	NDCD	2	NDSR2
3	NRX	4	NRTS2
5	NTX	6	NCTS2
7	NDTR	8	NR12
9	GND	10	GND
11	TXD485+	12	TXD485-
13	RXD485+	14	RXD485-

Table 4-18: RS-232/RS-485 Serial Port Connector Pinouts

#### 4.3.17 USB Connectors (Internal)

**CN Label:** USB01 and USB23

**CN Type:** 8-pin header (2x4)

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

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

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.

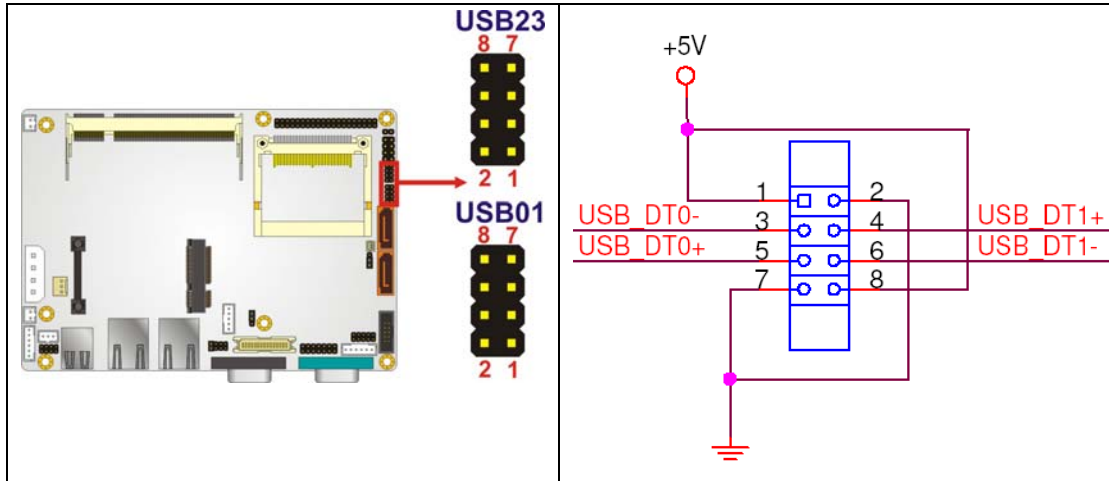


Figure 4-18: USB Connector Pinout Locations

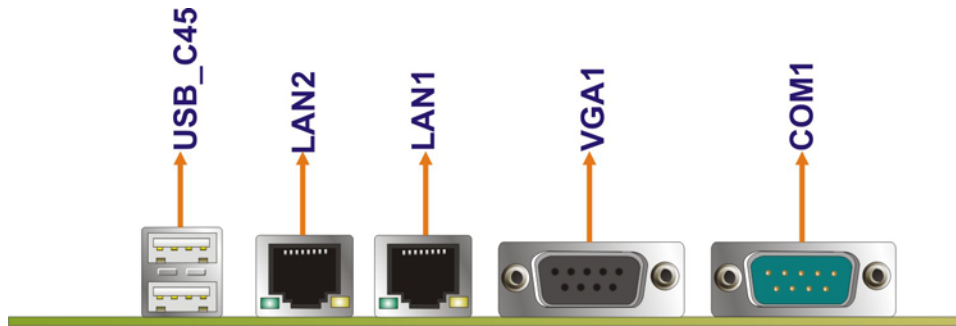
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 4-19: USB Port Connector Pinouts

## 4.4 External Peripheral Interface Connector Panel

Figure 4-19 shows the 3308480 external peripheral interface connector (EPIC) panel. The 3308480 EPIC panel consists of the following:

- 2 x RJ-45 LAN connectors
- 1 x Serial port connectors
- 2 x USB connectors
- 1 x VGA connector



**Figure 4-19: 3308480 External Peripheral Interface Connector**

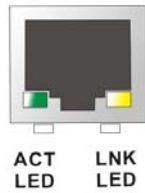
#### 4.4.1 LAN Connectors

- CN Label:** LAN1 and LAN2
- CN Type:** RJ-45
- CN Location:** See Figure 4-19
- CN Pinouts:** See Table 4-20

The 3308480 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

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

**Table 4-20: LAN Pinouts**



**Figure 4-20: 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 4-21**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

**Table 4-21: RJ-45 Ethernet Connector LEDs**

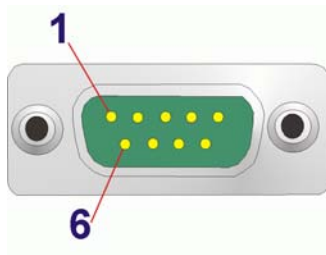
#### **4.4.2 Serial Port Connector (COM1)**

- CN Label:** COM1
- CN Type:** DB-9 connectors
- CN Location:** See Figure 4-19 (see 2)
- CN Pinouts:** See Table 4-22 and Figure 4-21

The 9-pin DB-9 serial port connectors are 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 4-22: RS-232 Serial Port (COM 1) Pinouts**



**Figure 4-21: COM1 Pinout Locations**

#### 4.4.3 USB Connectors

- CN Label:** USB
- CN Type:** Dual USB port
- CN Location:** See Figure 4-19
- CN Pinouts:** See Table 4-23

The 3308480 has two external USB 2.0 ports. The ports connect to both USB 2.0 and USB 1.1 devices.



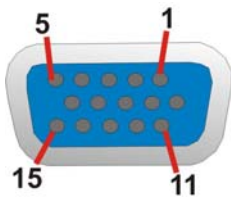
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	VCC
2	DATA-	6	DATA-
3	DATA+	7	DATA+
4	GND	8	GND

**Table 4-23: USB Port Pinouts**

#### 4.4.4 VGA Connector

- CN Label:** VGA1
- CN Type:** 15-pin Female
- CN Location:** See Figure 4-19
- CN Pinouts:** See Figure 4-22 and Table 4-24

The 3308480 has a single 15-pin female connector for connectivity to standard display devices.



**Figure 4-22: 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

---

PIN	DESCRIPTION	PIN	DESCRIPTION
13	HSYNC	14	VSYNC
15	DDCCLK		

**Table 4-24: VGA Connector Pinouts**

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Chapter

5

# Installation

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## 5.1 Anti-static Precautions

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### WARNING:

Failure to take ESD precautions during the installation of the 3308480 may result in permanent damage to the 3308480 and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the 3308480. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the 3308480, 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 3308480, place it on an anti-static pad. This reduces the possibility of ESD damaging the 3308480.
- ***Only handle the edges of the PCB:-:*** When handling the PCB, hold the PCB by the edges.

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## 5.2 Installation Considerations

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### NOTE:

The following installation notices and installation considerations should be read and understood before the 3308480 is installed. All installation notices pertaining to the installation of the 3308480 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the 3308480 and injury to the person installing the motherboard.

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### 5.2.1 Installation Notices

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### WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the 3308480, 3308480 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 3308480 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 3308480 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 3308480 off:

- 
- When working with the 3308480, 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 3308480 **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 3308480 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 3308480 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - SATA drives
  - Power supply
  - USB cable
  - Serial port cable
  - Keyboard and mouse cable
- The following external peripheral devices are properly connected to the chassis:
  - VGA screen
  - USB devices

## 5.3 Unpacking

When the 3308480 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

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contact the 3308480 vendor reseller/vendor where the 3308480 was purchased.

## 5.4 SO-DIMM and CF Card Installation

### 5.4.1 SO-DIMM Installation

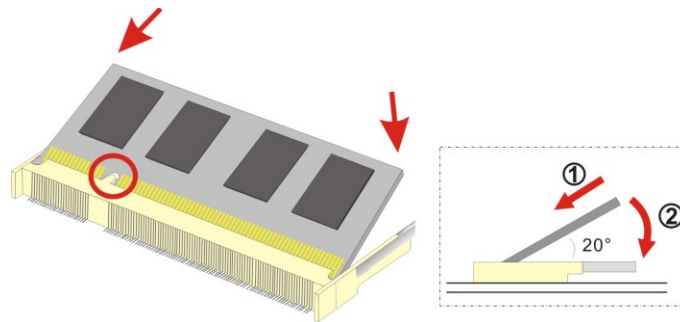


#### WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the 3308480. Please makesure the purchased SO-DIMM complies with the memory specifications of the 3308480. SO-DIMM specifications compliant with the 3308480 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**.



**Figure 5-1: SO-DIMM Installation**

- Step 1:** **Locate the SO-DIMM socket.** Place the 3308480 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.

### 5.4.2 CF Card Installation



#### NOTE:

The 3308480 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 3308480, please follow the steps below:

**Step 1: Locate the CF card socket.** Place the 3308480 on an anti-static pad with the solder side facing up. Locate the CF card.

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

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



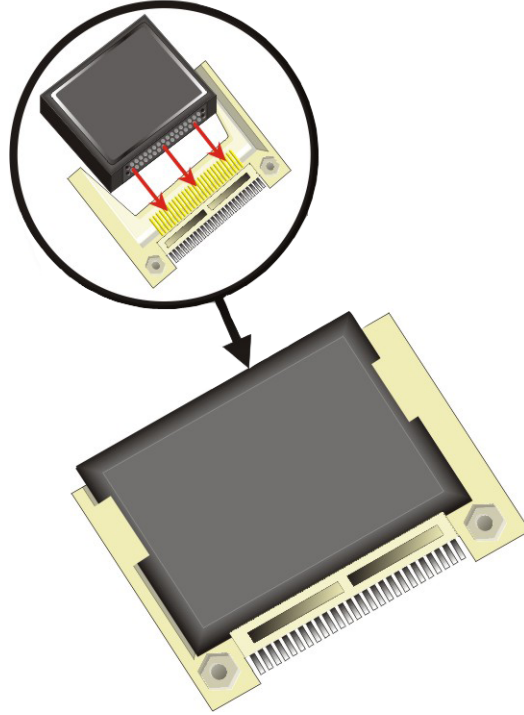


Figure 5-2: CF Card Installation

## 5.5 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.

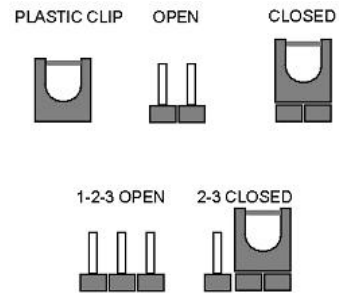


Figure 5-3: Jumper Locations

Before the 3308480 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the 3308480 are listed in **Table 5-1**.

Description	Label	Type
AT Power Mode Setting	ATXCTL1	2-pin header
CF Card Setting	JCF1	2-pin header
Clear CMOS	J_CMOS1	3-pin header
COM2 Mode Setting	JP1	6-pin header
LVDS1 Panel Resolution	J_LCD_TYPE1	8-pin header
LVDS1 Voltage Select	J_VLVDS1	3-pin header

**Table 5-1: Jumpers**

### 5.5.1 AT Power Select Jumper Settings



**NOTE:**

The AT Power Select Jumper is the same as the ATX Enable connector.

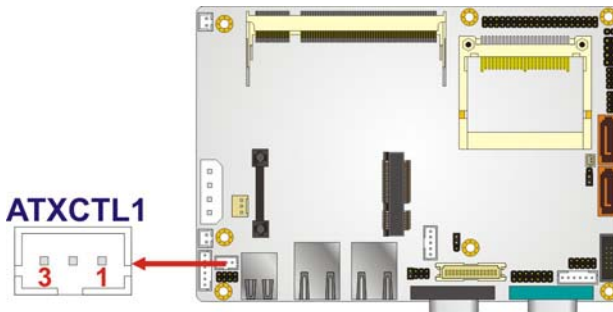
- Jumper Label:** ATXCT11
- Jumper Type:** 3-pin header
- Jumper Settings:** See **Table 5-2**
- Jumper Location:** See Figure 5-4

The AT Power Select jumper specifies the systems power mode as AT or ATX. Use a jumper cap to short pin 1 - pin 2 on the ATXCTL1 connector to enable the AT Power mode on the system. In the ATX mode use the PS\_ON- and 5VSB cable. AT Power Select jumper settings are shown in **Table 5-2**.

AT Power Select	Description	
Short 2 – 3	Use AT power	Default
OFF	Use ATX power	

**Table 5-2: AT Power Select Jumper Settings**

The location of the AT Power Select jumper is shown in Figure 5-4 below.



**Figure 5-4: AT Power Select Jumper Location**

### 5.5.2 CF Card Setup

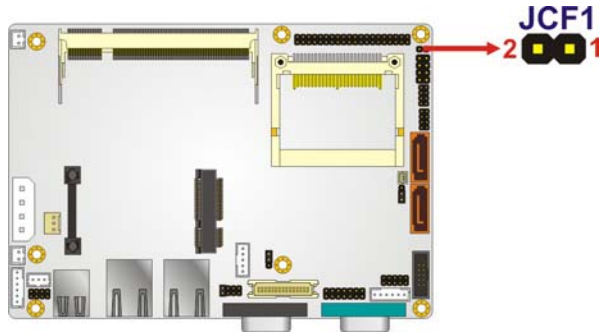
- Jumper Label:** JCF1
- Jumper Type:** 2-pin header
- Jumper Settings:** See Table 5-3
- Jumper Location:** See Figure 5-5

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 5-3.

CF Card Setup	Description	
OFF	Slave	Default
Short 1-2	Master	

**Table 5-3: 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**

### 5.5.3 Clear CMOS Jumper

<b>Jumper Label:</b>	J_CMOS1
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See Table 5-4
<b>Jumper Location:</b>	See Figure 5-6

If the 3308480 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.

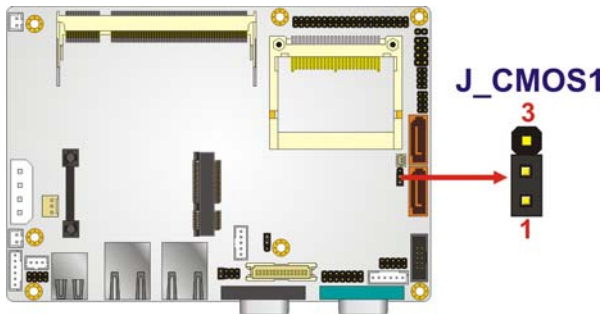
After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-4**.

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

**Table 5-4: Clear CMOS Jumper Settings**

The location of the clear CMOS jumper is shown in **Figure 5-6** below.



**Figure 5-6: Clear CMOS Jumper**

#### 5.5.4 COM 2 Function Select Jumper

<b>Jumper Label:</b>	<b>JP1</b>
<b>Jumper Type:</b>	8-pin header
<b>Jumper Settings:</b>	See <b>Table 5-5</b>
<b>Jumper Location:</b>	See <b>Figure 5-7</b>

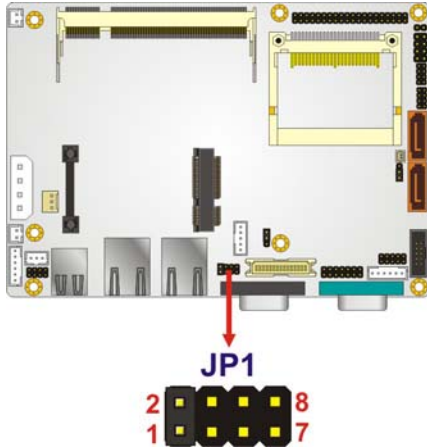
The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 5-5**.

COM 2 Function Select	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	

Short 5-6	RS-485 with RTS	
Short 7-8	control	

**Table 5-5: COM 2 Function Select Jumper Settings**

The COM 2 Function Select jumper location is shown in **Figure 5-7**.



**Figure 5-7: COM 2 Function Select Jumper Location**

### 5.5.5 LVDS1 Panel Resolution Jumper

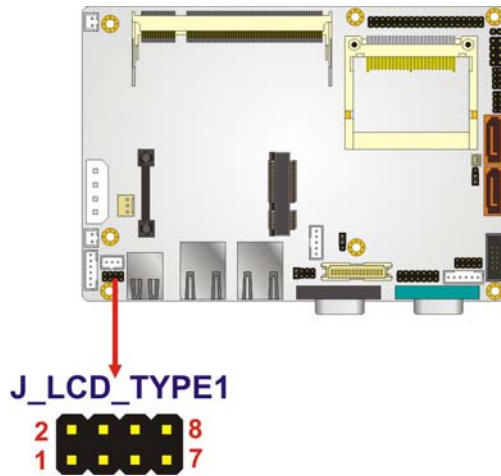
<b>Jumper Label:</b>	J_LCD_TYPE1
<b>Jumper Type:</b>	8-pin header
<b>Jumper Settings:</b>	See Table 5-6
<b>Jumper Location:</b>	See Figure 5-8

The LVDS1 Panel Resolution jumper allows the resolution of the LVDS screens connected to the LVDS1 connector to be configured. The LVDS1 Panel Resolution jumper settings are shown in Table 5-6.

J_LCD_TYPE1				DESCRIPTION
Pin 7- Pin 8	Pin 5- Pin 6	Pin 3- Pin 4	Pin 1-Pin 2	
OFF	OFF	OFF	OFF	640 x 480 18-bit
OFF	OFF	OFF	ON	800 x 480 18-bit
OFF	OFF	ON	OFF	800 x 600 18-bit (Default)
OFF	OFF	ON	ON	1024 x 768 18-bit
OFF	ON	OFF	OFF	1280 x 1024 36-bit
OFF	ON	OFF	ON	1400 x 1050 36-bit
OFF	ON	ON	OFF	1400 x 900 36-bit
OFF	ON	ON	ON	1600 x 1200 36-bit

**Table 5-6: LVDS Panel Resolution Jumper Settings**

The LVDS Panel Resolution jumper location. is shown in Figure 5-8.



**Figure 5-8:LVDS Panel Resolution Jumper Pinout Locations**

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## 5.5.6 LVDS Voltage Selection

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### **WARNING:**

Permanent damage to the screen and 3308480 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 5-9**

The **LVDS Voltage Selection** jumpers allow the LVDS screen voltages to be set. J\_VLVDS1 sets the voltage connected to LVDS1 and J\_VLVDS2 sets the voltage for the screen connected to LVDS2. The **LVDS Voltage Selection** jumper settings are shown in **Table 5-7**.

LCD Voltage Select	Description	
Short 1-2	+3.3V LVDS	Default
Short 2-3	+5V LVDS	

**Table 5-7: LVDS Voltage Selection Jumper Settings**

The LVDS Voltage Selection jumper location. is shown in **Figure 5-9**.



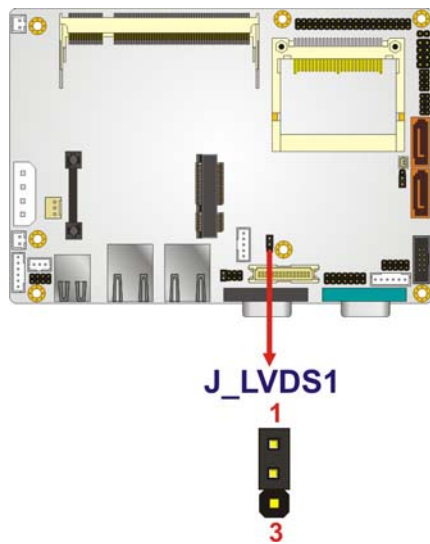


Figure 5-9: LVDS Voltage Selection Jumper Pinout Locations

## 5.6 Chassis Installation

### 5.6.1 Airflow



#### **WARNING:**

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the 3308480 must have air vents to allow cool air to move into the system and hot air to move out.

The 3308480 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.

---

## 5.6.2 Motherboard Installation

To install the 3308480 motherboard into the chassis please refer to the reference material that came with the chassis.

## 5.7 Internal Peripheral Device Connections

### 5.7.1 Peripheral Device Cables

The cables listed in **Table 5-8** are shipped with the 3308480.

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

**Table 5-8: Provided Cables**

Some optional items that can be purchased separately and installed on the 3308480 include:

- Dual port USB cable
- RS-232/422/485 cable
- ATX power cable
- SATA power cable

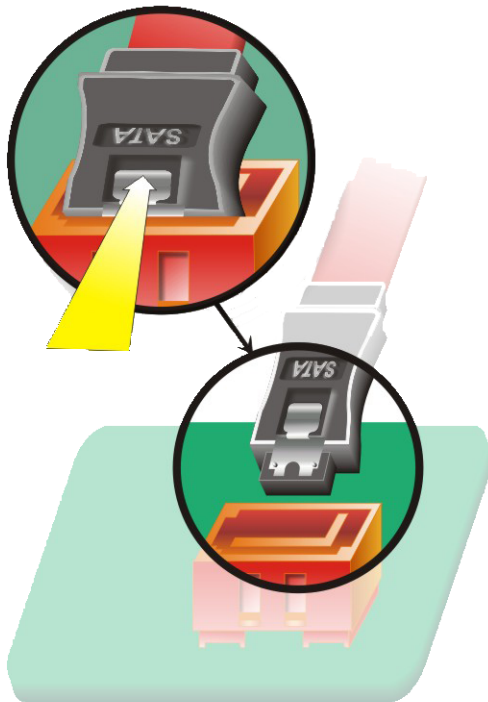
- 4-COM port kit

## 5.7.2 SATA Drive Connection

The 3308480 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**.



**NOTE:**

The SATA power cable described below is an optional item and must be pre-ordered. The SATA power cable is not shipped with the system.

---

**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**

### **5.7.3 Serial Port Connector Cable (Four Ports) Cable Connection**

The 3308480 is shipped with one four serial port connector cable. The four serial port connector cable connects four serial port connectors on the cable to the 40-pin serial port connectors on the 3308480. To connect the four serial port connector cable please follow the steps below.

**Step 1:** **Locate the serial port connector.** The location of the 40-pin serial port connector is shown in **Chapter 3**.

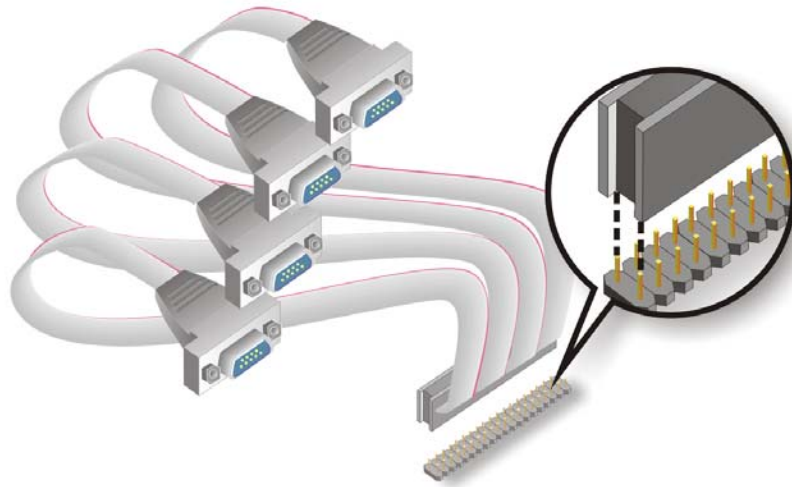
**Step 2:** **Align the connectors.** Correctly align pin 1 on the cable connector with pin 1 on

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the 3308480 40-pin serial port connector. See

**Figure 5-16.**

**Step 3: Insert the cable connectors** Once the cable connector is properly aligned with the 40-pin serial port connector on the 3308480, connect the cable connector to the on-board connectors. See **Figure 5-16.**



**Figure 5-12: Four Serial Port Connector Cable Connection**

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

#### **5.7.4 Dual RS-232 Cable Connection (w/o bracket) (Optional)**

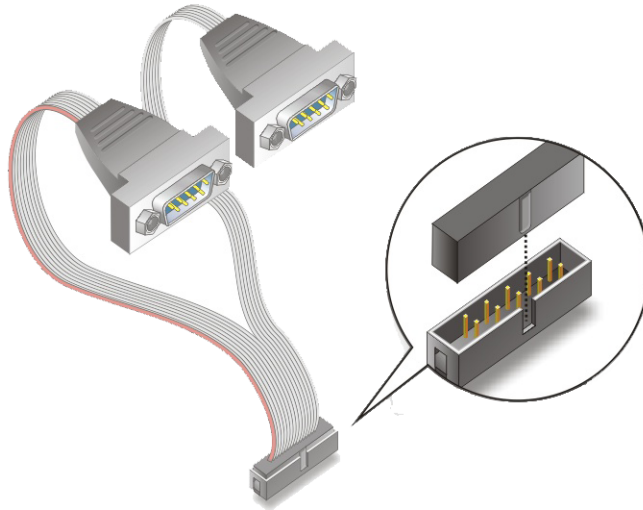
The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9-pin male connector. To install the dual RS-232 cable, please follow the steps below.

**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 Error! Reference source not found.. A key on the front of the cable connectors ensures the connector can only be installed in one direction.



**Figure 5-13: Dual RS-232 Cable Installation**

**Step 3: Secure the connectors.** Both single RS-232 connectors have two retention screws that must be secured to a chassis or bracket.

**Step 4: Connect the serial device.** Once the single RS-232 connectors are connected to a chassis or bracket, a serial communications device can be connected to the system.

#### 5.7.5 4-COM Port Adapter Board Connection (Optional)

An optional, separately purchased 4-COM port adapter board may be shipped with the 3308480 . To install the 4-COM Port Adapter Board, please follow the steps below.

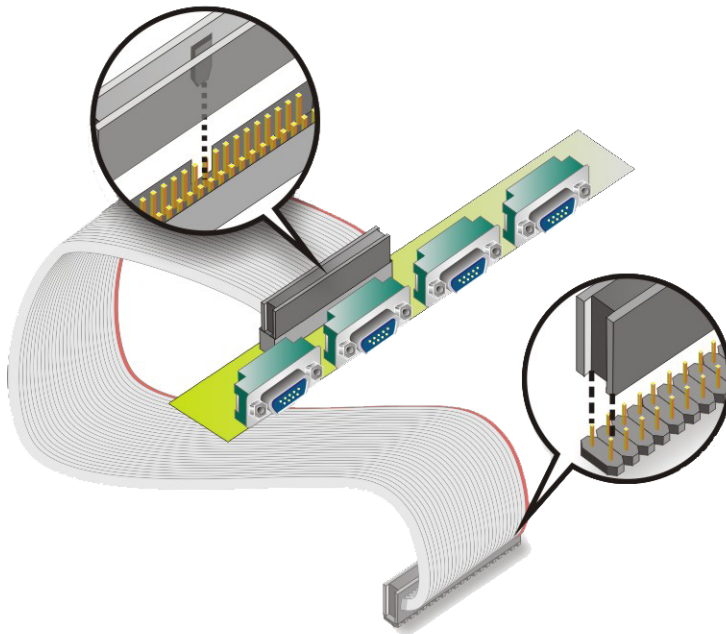
**Step 1: Locate the COM connector.** The locations of the COM port connectors are shown in Chapter 4.

**Step 2: Insert the cable connector.** Align the cable connector with the onboard

---

connector. Make sure the pin 1 on the cable connector is properly aligned with pin 1 on the board connector. Figure 5-14.

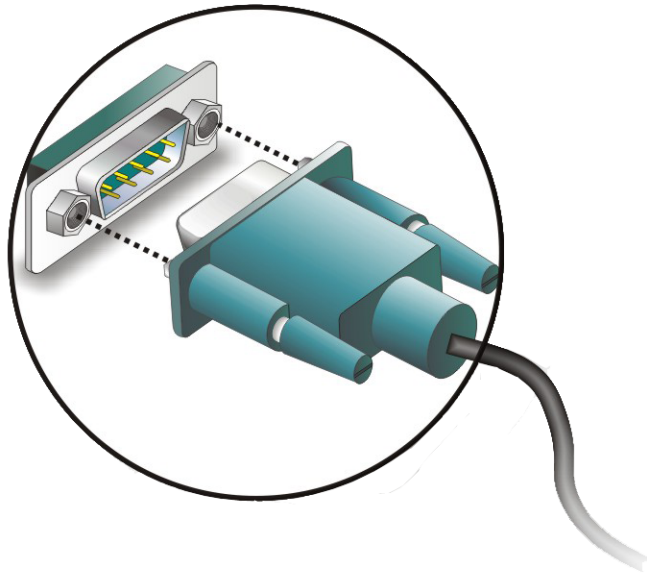
**Step 3:** **Connect the adapter board to the cable.** The adapter board with the four COM ports must then be attached to the cable. Make sure the cable connector is properly aligned with the connector on the adapter board. Make sure the pin 1 on the adapter board connector and the cable connector are aligned. See Figure 5-14.



**Figure 5-14: 4-COM Port Adapter Board**

**Step 4:** **Secure the adapter board to the chassis.** Make sure the retention screws on either side of each COM port DB-9 connector are firmly secured to the chassis enclosure.

**Step 5:** **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 5-15.



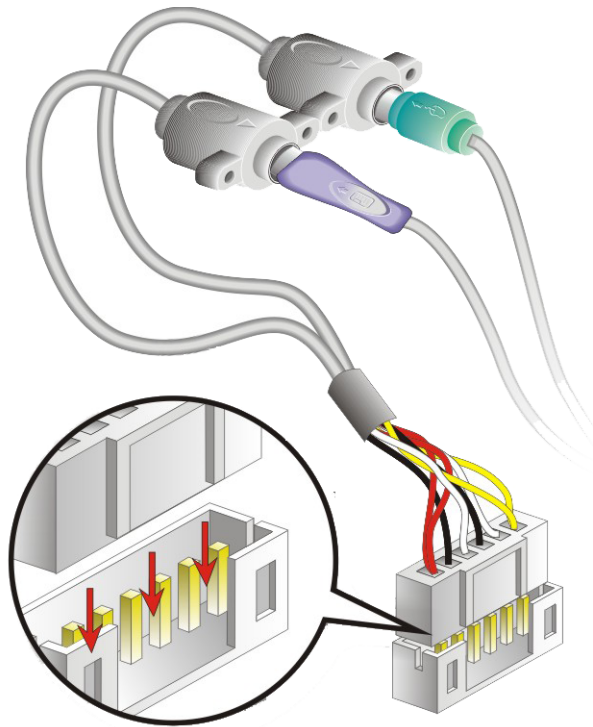
**Figure 5-15: Serial Device Connector**

### 5.7.6 Keyboard/Mouse Y-cable Connector

The 3308480 is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the 3308480 and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector please follow the steps below.

- Step 1: Locate the connector.** The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.
- Step 2: Align the connectors.** Correctly align pin 1 on the cable connector with pin 1 on the 3308480 keyboard/mouse connector. See **Figure 5-16**.
- Step 3: Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the 3308480, connect the cable connector to the on-board connectors. See **Figure 5-16**.





**Figure 5-16: Keyboard/mouse Y-cable Connection**

**Step 4:** **Attach PS/2 connectors to the chassis.** The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

**Step 5:** **Connect the keyboard and mouse.** Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

### 5.7.7 Audio Kit Installation

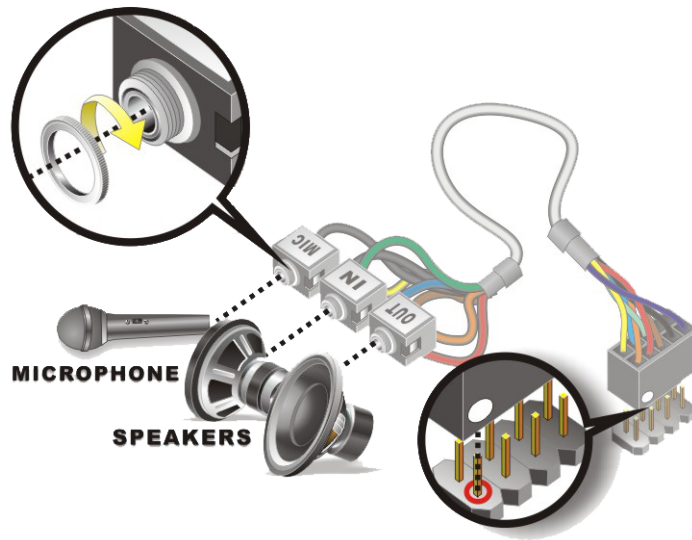
The Audio Kit that came with the 3308480 connects to the 10-pin audio connector on the 3308480. The audio kit consists of three audio jacks. One audio jack, Mic In,

---

connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two speakers. To install the audio kit, please refer to the steps below:

**Step 1: Locate the audio connector.** The location of the 10-pin audio connector is shown in **Chapter 3**.

**Step 2: Align pin 1.** Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 5-17**.



**Figure 5-17: Audio Kit Cable Connection**

**Step 3: 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.

### 5.7.8 USB Cable (Dual Port without Bracket) (Optional)

The 3308480 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.

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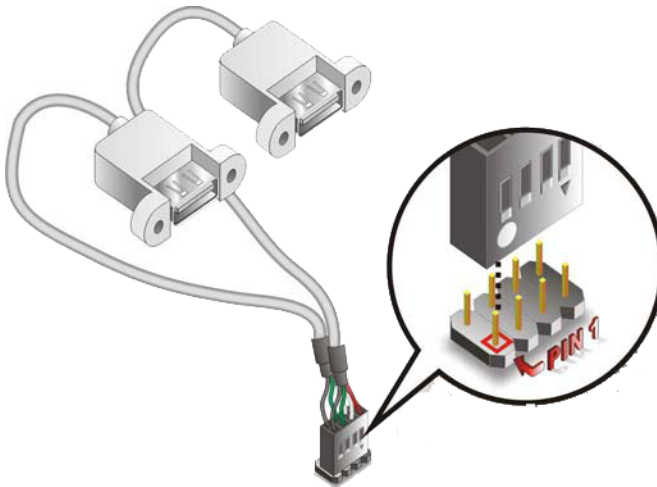
### **WARNING:**

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 1 on each cable connector with pin 1 on the 3308480 USB connector.

**Step 3:** **Insert the cable connectors.** Once the cable connectors are properly aligned with the USB connectors on the 3308480, connect the cable connectors to the on-board connectors. See **Figure 5-18**.



**Figure 5-18: Dual USB Cable Connection**

**Step 4:** **Attach the USB connectors to the chassis.** The USB 2.0 connectors each of two retention screw holes. To secure the connectors to the chassis please refer to the installation instructions that came with the chassis.

## 5.8 External Peripheral Interface Connection

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

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

To install these devices, connect the corresponding cable connector from the actual device to the corresponding 3308480 external peripheral interface connector making sure the pins are properly aligned.

### 5.8.1 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 3308480. See **Figure 5-19**.

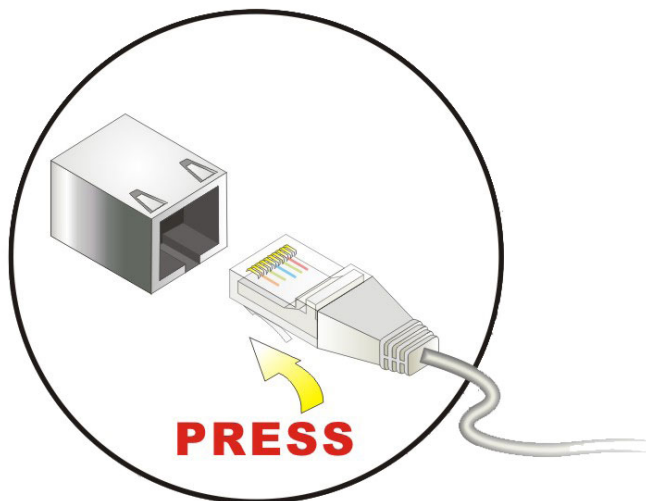


Figure 5-19: LAN Connection

---

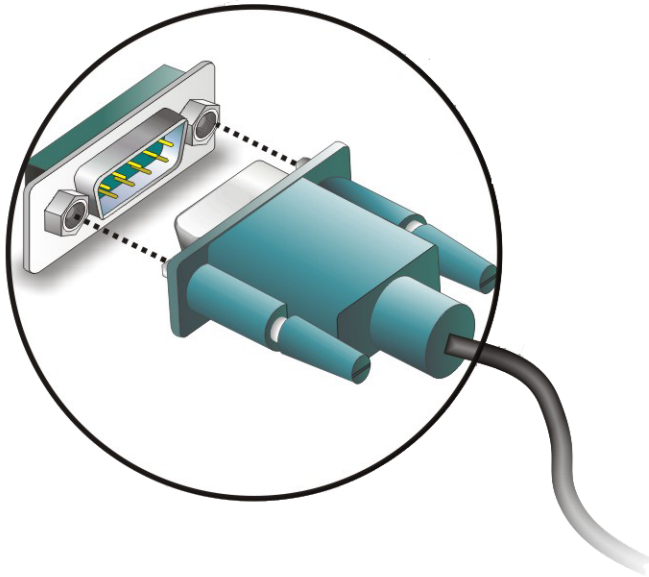
**Step 3:** Insert the LAN cable RJ-45 connector. Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

## 5.8.2 Serial Device Connection

The 3308480 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 3308480.

**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

---

### 5.8.3 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 3308480.

**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**.

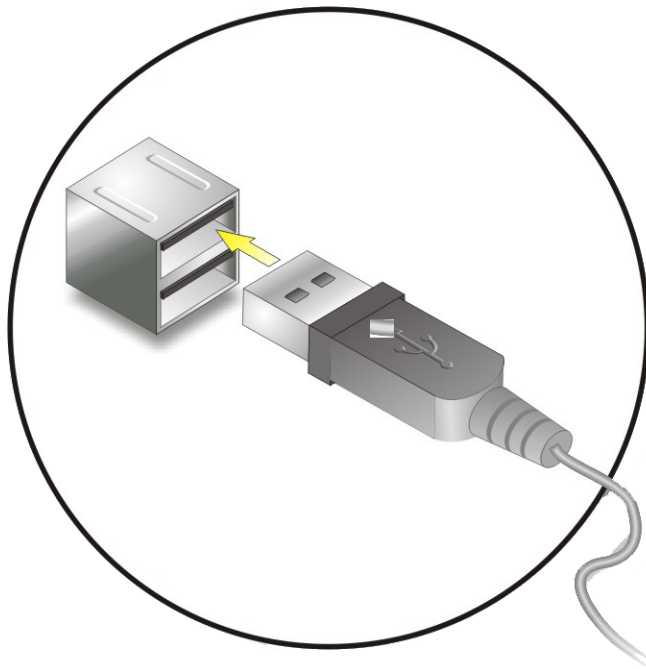


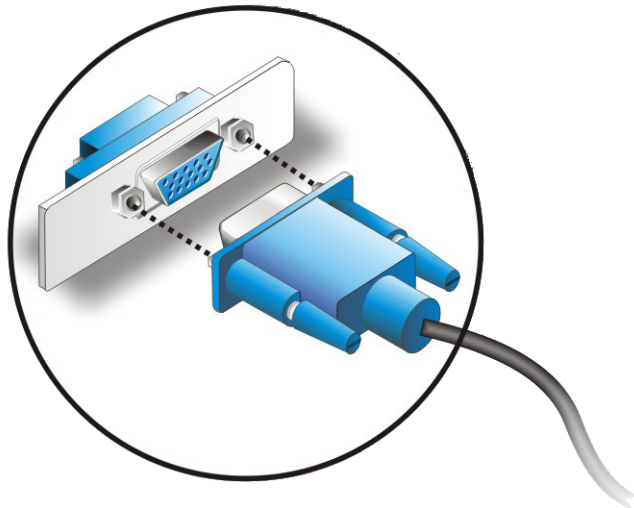
Figure 5-21: USB Connector

---

## 5.8.4 VGA Monitor Connection

The 3308480 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 3308480, 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 3308480 . See **Figure 5-22**.



**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.

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## 5.9 Heat Sink Enclosure

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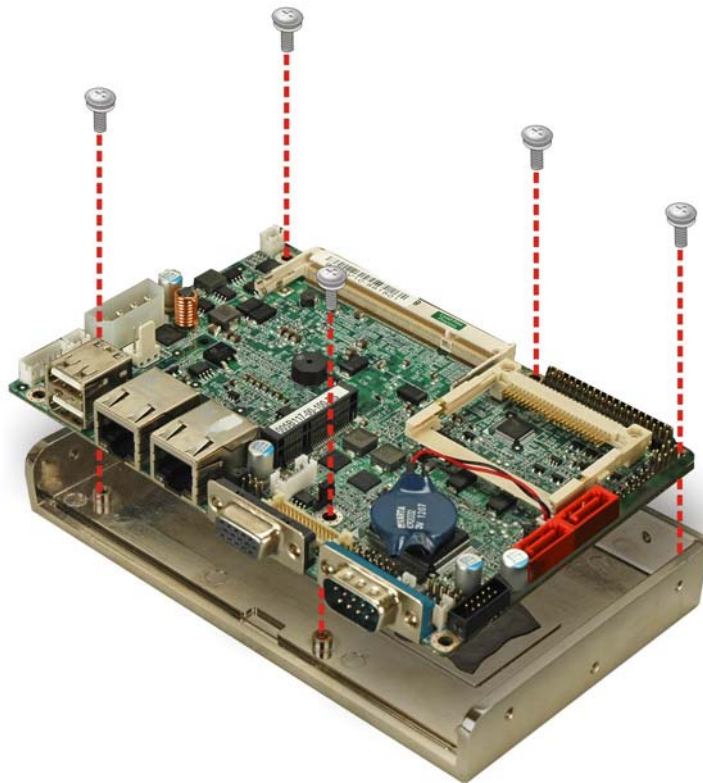


### **WARNING:**

Never run the 3308480 without the heat sink secured to the board. The heat sink ensures the system remains cool and does not need addition heat sinks to cool the system.

---

When the 3308480 is shipped it is secured to a heat sink with five retention screws. If the 3308480 must be removed from the heat sink, the five retention screws must be removed.



**Figure 5-23: Heat Sink Retention Screws**



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Appendix

C

# DIO Interface

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## C.1 DIO Interface Introduction

The DIO connector on the 3308480 is interfaced to GPIO ports on the ITE IT8718F Super I/O chipset. The DIO 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 ITE IT8718F Super I/O chipset.

---

## C.2 DIO Connector Pinouts

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

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP23	General Purpose I/O Port 2 Bit 3
4	Output 2	GP22	General Purpose I/O Port 2 Bit 2
5	Output 1	GP21	General Purpose I/O Port 2 Bit 1
6	Output 0	GP20	General Purpose I/O Port 2 Bit 0
7	Input 3	GP33	General Purpose I/O 33
8	Input 2	GP32	General Purpose I/O 32
9	Input 1	GP31	General Purpose I/O 31
10	Input 0	GP30	General Purpose I/O 30

---

## C.3 Assembly Language Samples

### C.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

### C.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

D

# Watchdog Timer

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---

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:**

<b>AH – 6FH Sub-function:</b>	
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 D-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

E

# Address Mapping

---

## E.1 I/O Address Map

Address Range	Device Name
[00000000 - 0000000F]	Direct memory access controller
[00000000 - 00000CF7]	PCI bus
[00000010 - 0000001F]	Motherboard resources
[00000020 - 00000021]	Programmable interrupt controller
[00000022 - 0000003F]	Motherboard resources
[00000040 - 00000043]	System timer
[00000044 - 0000005F]	Motherboard resources
[00000061 - 00000061]	System speaker
[00000063 - 00000063]	Motherboard resources
[00000065 - 00000065]	Motherboard resources
[00000067 - 0000006F]	Motherboard resources
[00000070 - 00000071]	System CMOS/real time clock
[00000072 - 0000007F]	Motherboard resources
[00000080 - 00000080]	Motherboard resources
[00000081 - 00000083]	Direct memory access controller
[00000084 - 00000086]	Motherboard resources
[00000087 - 00000087]	Direct memory access controller
[00000088 - 00000088]	Motherboard resources
[00000089 - 0000008B]	Direct memory access controller
[0000008C - 0000008E]	Motherboard resources
[0000008F - 0000008F]	Direct memory access controller
[00000090 - 0000009F]	Motherboard resources
[000000A0 - 000000A1]	Programmable interrupt controller
[000000A2 - 000000BF]	Motherboard resources
[000000C0 - 000000DF]	Direct memory access controller
[000000E0 - 000000EF]	Motherboard resources
[000000F0 - 000000FF]	Numeric data processor
[00000170 - 00000177]	Secondary IDE Channel

























[000001F0 - 000001F7]	Primary IDE Channel
[00000274 - 00000277]	ISAPNP Read Data Port
[00000279 - 00000279]	ISAPNP Read Data Port
[000002E8 - 000002EF]	Communications Port (COM4)
[000002F8 - 000002FF]	Communications Port (COM2)
[00000376 - 00000376]	Secondary IDE Channel
[00000378 - 0000037F]	Printer Port (LPT1)
[000003B0 - 000003BB]	Mobile Intel(R) 945 Express Chipset Family
[000003C0 - 000003DF]	Mobile Intel(R) 945 Express Chipset Family
[000003E8 - 000003EF]	Communications Port (COM3)
[000003F6 - 000003F6]	Primary IDE Channel
[000003F8 - 000003FF]	Communications Port (COM1)
[00000400 - 0000041F]	Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
[00000480 - 000004BF]	Motherboard resources
[000004D0 - 000004D1]	Motherboard resources
[00000800 - 0000087F]	Motherboard resources
[00000A00 - 00000A0F]	Motherboard resources
[00000A10 - 00000A1F]	Motherboard resources
[00000A20 - 00000A2F]	Motherboard resources
[00000A30 - 00000A3F]	Motherboard resources
[00000A60 - 00000A6F]	Motherboard resources
[00000A79 - 00000A79]	ISAPNP Read Data Port
[00000D00 - 0000FFFF]	PCI bus
[0000C480 - 0000C49F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
[0000C800 - 0000C81F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
[0000C880 - 0000C89F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
[0000CC00 - 0000CC1F]	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
[0000CC80 - 0000CC87]	Mobile Intel(R) 945 Express Chipset Family
[0000D000 - 0000DFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[0000DC00 - 0000DCFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC #2
[0000E000 - 0000EFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
[0000EC00 - 0000ECFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC
[0000FFA0 - 0000FFAF]	Intel(R) 82801GBM/GHM (ICH7-M Family) Serial ATA Storage Controller

**Table E-1: IO Address Map**

---

## E.2 IRQ Address Map

 Interrupt request (IRQ)

	(ISA) 0	System timer
	(ISA) 3	Communications Port (COM2)
	(ISA) 4	Communications Port (COM1)
	(ISA) 8	System CMOS/real time clock
	(ISA) 9	Microsoft ACPI-Compliant System
	(ISA) 10	Communications Port (COM4)
	(ISA) 11	Communications Port (COM3)
	(ISA) 13	Numeric data processor
	(ISA) 14	Primary IDE Channel
	(ISA) 15	Secondary IDE Channel
	(PCI) 5	Intel(R) 82801G (ICH7 Family) SMBus Controller - 27DA
	(PCI) 16	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
	(PCI) 16	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CB
	(PCI) 16	Mobile Intel(R) 945 Express Chipset Family
	(PCI) 16	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC #2
	(PCI) 17	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
	(PCI) 17	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC
	(PCI) 18	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27CA
	(PCI) 19	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C9
	(PCI) 23	Intel(R) 82801G (ICH7 Family) USB Universal Host Controller - 27C8
	(PCI) 23	Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC

.....

**Table E-2: IRQ Address Map**

## E.3 Memory Address Map

Memory Address Range	Device / Resource
[00000000 - 0009FFFF]	System board
[000A0000 - 000BFFFF]	Mobile Intel(R) 945 Express Chipset Family
[000A0000 - 000BFFFF]	PCI bus
[000C0000 - 000CFFFF]	System board
[000D0000 - 000DFFFF]	PCI bus
[000E0000 - 000FFFFF]	System board
[00100000 - 3F7FFFFF]	System board
[3F800000 - DFFFFFFF]	PCI bus
[D0000000 - DFFFFFFF]	Mobile Intel(R) 945 Express Chipset Family
[E0000000 - E3FFFFFF]	Motherboard resources
[E4000000 - FED8FFFF]	PCI bus
[FDE00000 - FDEFFFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[FDEF0000 - FDEFFFFFFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC #2
[FDF00000 - FDFFFFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
[FDFF0000 - FDFFFFFFFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC
[FE880000 - FE8FFFFFFF]	Mobile Intel(R) 945 Express Chipset Family
[FE93BC00 - FE93BFFF]	Intel(R) 82801G (ICH7 Family) USB2 Enhanced Host Controller - 27CC
[FE940000 - FE97FFFF]	Mobile Intel(R) 945 Express Chipset Family
[FE980000 - FE9FFFFFFF]	Mobile Intel(R) 945 Express Chipset Family
[FEA00000 - FEAFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D0
[FEAFF000 - FEAFFFFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC #2
[FEB00000 - FEBFFFFFFF]	Intel(R) 82801G (ICH7 Family) PCI Express Root Port - 27D2
[FEBFF000 - FEBFFFFFFF]	Realtek RTL8168C(P)/8111C(P) PCI-E Gigabit Ethernet NIC
[FEC00000 - FEC00FFF]	Motherboard resources
[FED13000 - FED19FFF]	System board
[FED1C000 - FED1FFFF]	Motherboard resources
[FED20000 - FED3FFFF]	Motherboard resources
[FED40000 - FED8FFFF]	Motherboard resources
[FED90000 - FFFFFFFF]	System board
[FEE00000 - FEE00FFF]	Motherboard resources

**Table E-3: Memory Address Map**

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Appendix

**F**

# **Hazardous Materials Disclosure**

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## **F.1 Hazardous Material Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury**

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated “Environmentally Friendly Use Period” (EFUP). This is an estimate of the number of years that these substances would “not leak out or undergo abrupt change.” This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有“环境友好使用期限”的标签，此期限是估算这些物质“不会有泄漏或突变”的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。  
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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