integration with integrity

User's Manual

Single Board Computer 2807970

Version 1.0, June 2007

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Safety Instructions

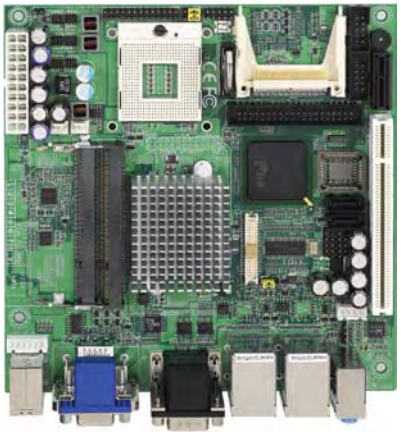
Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This helps to discharge any static electricity on your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components. Fasten the ALLIGATOR clip of the strap to the end of the shielded wire lead from a grounded object. Please wear and connect the strap before handle the product to ensure harmlessly discharge any static electricity through the strap.
- Please use an anti-static pad when putting down any components or parts or tools outside the computer. You may also use an anti-static bag instead of the pad. Please inquire from your local supplier for additional assistance in finding the necessary anti-static gadgets.

NOTE: *DO NOT TOUCH THE BOARD OR ANY OTHER SENSITIVE COMPONENTS WITHOUT ALL NECESSARY ANTI-STATIC PROTECTIONS.*

Chapter 1

General Description



The 2807970 all-in-one Mini-ITX is designed to fit a high performance Intel® Core™ Duo based processor and compatible for high-end computer system applications with PCI bus architecture to meet today's demanding pace and keep complete compatibility with hardware and software designed. The onboard device supports one PCI Express x1 and one PCI slot, integrated graphics, and onboard dual Marvell Gigabit Ethernet controllers. It's beneficial to build up a high performance and high data availability system for VARs, or system integrators.

The 2807970 supports Intel® Core™ Duo socket M processors built Intel® 945GM and ICH7-M chipset integrated GMA950 graphics with DVMT3.0 display memory up to 224MB for dual display function by VGA/LVDS, VGA/DVI, and DVI/LVDS. The board supports two SO-DIMMs up to 2GB with dual channel DDRII 533/667, enhanced onboard one PCI-IDE interface supporting one drive up to PIO mode 4 timing and Ultra ATA/33/66/100 synchronous mode feature, one CF socket interface, and two SATAII high-speed data transferring at up to 3GB/s, integrated RealTek ALC655 AC97 codec. The onboard super I/O chipset support 4 serial ports, Hardware Monitor function, 8 USB2.0 ports offering up to 40X greater bandwidth over USB1.1, and two PS/2 6-pin Mini DIN connectors for PS/2 mouse and keyboard.

Besides, high precision Real Time Clock built to support Y2K for accurate scheduling and storing configuration information, one 20-pin standard connector designed to support ATX power function, and a feature of CPU overheat protection will provide user more security and stability.

Target for key embedded applications such as Point of Sales (POS), automated KIOSKs, medical instruments, advanced automation for buildings and homes, and gAwardng machines. All of these features make 2807970 excellent in all-in-one applications.

1.1 Major Features

The 2807970 comes with the following features:

- Intel® Core™ 2 Duo/Core™ Solo/Celeron® M processor
- Supports 667/533MHz FSB
- Two SO-DDRII sockets with a max. capacity of 2GB
- Intel® 945GM MCH/ICH7-M chipset
- ITE IT8712F super I/O chipset
- Intel® 945GM graphics controller
- 18-bit/36-bit LVDS panel display interface
- Dual GB Ethernet controller
- ALC655 5.1CH audio codec
- Intel® ICH7-M Serial ATA controller
- Fast PCI ATA/33/66/100 IDE controller
- CF, x1 PCI-E slot, 4 COM, 8 USB
- Hardware Monitor function

1.2 Specifications

- **CPU:**
  Intel® Core™ 2 Duo processor T7000/T5000
  Intel® Core™ 2 Duo/Core™ Solo processor T2000/T1000
  Intel® Celeron® M processor 400MHz
- **Front Side Bus:** 667/533MHz FSB
- **Memory:** Two SO-DDRII sockets supports up to 2GB
- **Chipset:** Intel® 945GM MCH/ICH7-M
- **I/O Chipset:** ITE IT8712F
- **CompactFlash:** One, Type I/II IDE interface adapter
- **PCI Slot:** x1 PCI-Express slot x 1, standard PCI slot
- **8-bit I/O:** 8-bit input/output (parallel port)
- **VGA:** Intel® 945GM integrated GMA950 graphics with DVMT3.0 for CRT or optional CHRONTEL 7307 for DVI display, supports up to 2048 x 1536 @ 75Hz

- **LVDS Panel:** Supports 18-bit single channel/36-bit dual channel LVDS interface (optional)
- **Ethernet:** Dual 10/100/1000 Based LAN
- **Audio:** ALC655 5.1CH audio codec
- **Serial ATA:** Intel® ICH7-M controller and with two ports
- **IDE:** One 2.54-pitch 40-pin IDE connector
- **Parallel:** One enhanced bi-directional parallel port
- **Serial Port:** 16C550 UART-compatible RS-232 x 4 serial ports with 16-byte FIFO
- **IrDA:** One IrDA TX/RX header
- **USB:** 8 USB ports, internal x 4 and external x 4
- **Keyboard:** PS/2 6-pin Mini DIN
- **Mouse:** PS/2 6-pin Mini DIN
- **BIOS:** Award PnP Flash BIOS with 4Mb Flash ROM
- **Watchdog Timer:** Software programmable time-out intervals from 1~255 sec.
- **CMOS:** Battery backup
- **Hardware Monitor:** ITE IT8712F
- **Board Size:** 17.0(L) x 17.0(W) cm

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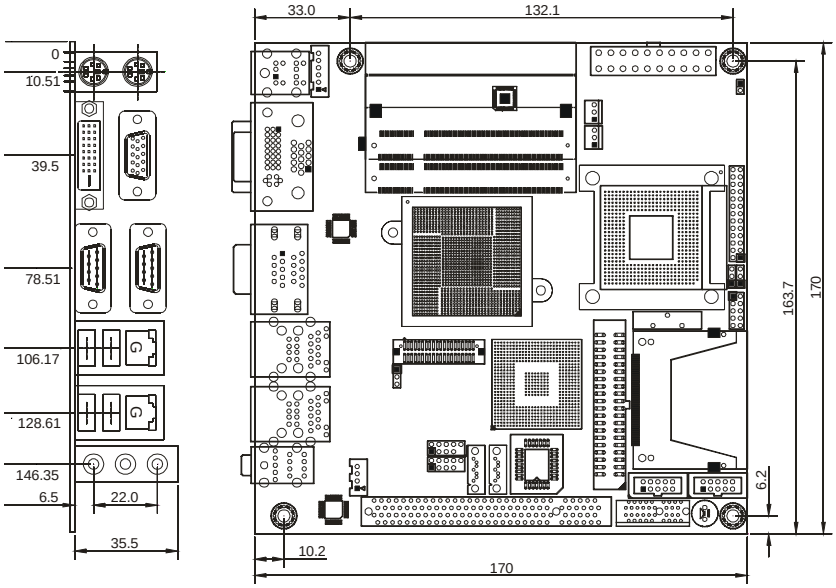
1.3 Board Dimensions



Chapter 2

Unpacking

2.1 Opening the Delivery Package

The 2807970 is packed in an anti-static bag. The board has components that are easily damaged by static electricity. Do not remove the anti-static wrapping until proper precautions have been taken. Safety Instructions in front of this manual describe anti-static precautions and procedures.

2.2 Inspection

After unpacking the board, place it on a raised surface and carefully inspect the board for any damage that might have occurred during shipment. Ground the board and exercise extreme care to prevent damage to the board from static electricity.

Integrated circuits will sometimes come out of their sockets during shipment. ExAwardne all integrated circuits, particularly the BIOS, processor, memory modules, ROM-Disk, and keyboard controller chip to ensure that they are firmly seated. The 2807970 delivery package contains the following items:

- **2807970 Board x 1**
- **Utility CD Disk x 1**
- **Cables Package x 1**
- **Jumper Bag x 1**
- **User's Manual**

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It is recommended that you keep all the parts of the delivery package intact and store them in a safe/dry place for any unforeseen event requiring the return shipment of the product. In case you discover any missing and/or damaged items from the list of items, please contact your dealer immediately.

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Chapter 3

Hardware Installation

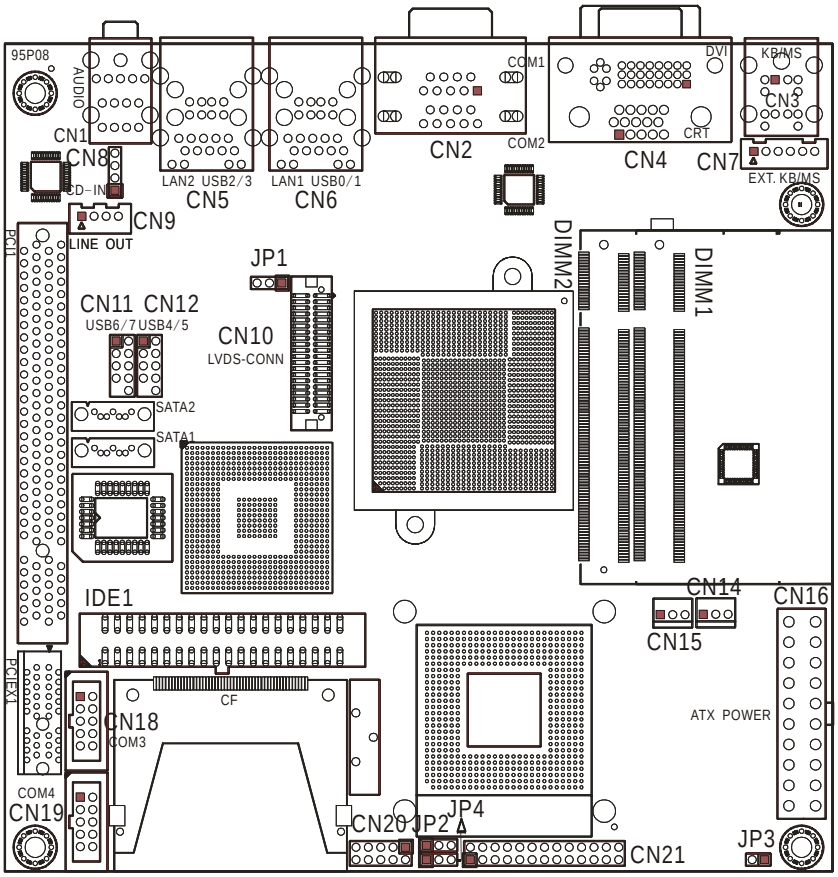
This chapter provides the information on how to install the hardware using the 2807970. This chapter also contains information related to jumper settings of switch, and watchdog timer selection etc.

3.1 Before Installation

After confirming your package contents, you are now ready to install your hardware. The following are important reminders and steps to take before you begin with your installation process.

1. Make sure that all jumper settings match their default settings and CMOS setup correctly. Refer to the sections on this chapter for the default settings of each jumper. (Set JP2 short 1-2)
2. Go through the connections of all external devices and make sure that they are installed properly and configured correctly within the CMOS setup. Refer to the sections on this chapter for the detailed information on the connectors.
3. Keep the manual and diskette in good condition for future reference and use.

3.2 Board Layout



3.3 Jumper List

Jumper	Default Setting	Setting	Page
JP1	Panel Voltage Select: *+3.3V*	Short 1-2	19
JP2	Clear CMOS: *Normal Operation*	Short 1-2	
JP3	Auto Power On Select: *Disabled*	Open	11
JP4	BIOS Write Protection Select: *Enabled*	Short 1-2	10

3.4 Connector List

Connector	Definition	Page
CN1	External Audio Connector	
CN2	COM 1/COM 2 Connector (DB9)	
CN3	PS/2 6-pin Mini DIN KB/MS Connector	
CN4	15-pin CRT & 24-pin DVI Connector	
CN5/CN6	RJ-45 & Dual USB Port	
CN7	6-pin KB/MS Connector	
CN8	CD In Connector	
CN9	Line Out Connector	
CN10	LVDS Connector	
CN11/CN12	Internal USB Connector	
CN14	System Fan Power In Connector	
CN15	CPU Fan Power In Connector	
CN16	20-pin ATX Power In Connector	
CN18/CN19	COM 3/COM 4 Connector (5x2 header)	
CN20	8-bit Digital I/O Port	
CN21	System Front Panel Connector	
IDE1	IDE Connector	
SATA1/SATA2	SATA Port	
CFII	TypeII CompactFlash Connector	
DIMM1/DIMM2	DDRII Socket	
PCI	Standard PCI Slot	
PCIEX1	x1 PCI Express Slot	

3.5 Configuring the CPU

The 2807970 provides with Intel® Core™ 2 Duo processor T7000/T5000, Intel® Core™ 2 Duo/Core™ Solo processor T2000/T1000, Intel® Celeron® M processor 400MHz. User don't need to adjust the frequently and check speed of processor.

3.6 System Memory

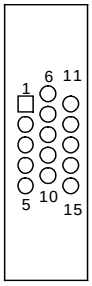
The 2807970 provides two SO-DDRII sockets at locations *DIMM1/DIMM2*. The maximum capacity of the onboard memory is 2GB.

3.7 VGA Controller

The 2807970 provides three connection methods of a VGA device. *CN4* offers a single standard CRT connector and a DVI connector. *CN10* are the LVDS interface connectors onboard reserved for flat panel installation.

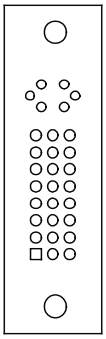
- **CN4(CRT): CRT Connector**

PIN	Description	PIN	Description
1	Red	2	Green
3	Blue	4	N/C
5	GND	6	GND
7	GND	8	GND
9	+5V	10	GND
11	N/C	12	DCC Data
13	HSYNC	14	VSYNC
15	DCC CLK		



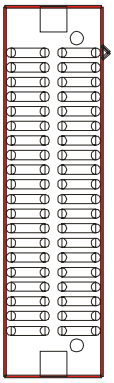
- **CN4(DVI): DVI Connector**

PIN	Description	PIN	Description
1	TDC2#	2	TDC2
3	GND	4	N/C
5	N/C	6	SC DDC
7	SD DDC	8	N/C
9	TDC1#	10	TDC1
11	GND	12	N/C
13	N/C	14	DVI 5V
15	GND	16	DVI DET
17	TEC0#	18	TDC0
19	GND	20	N/C
21	N/C	22	GND
23	TLC	24	TLC#



- **CN10: LVDS Interface Connector**

PIN	Description	PIN	Description
1	N/C	2	N/C
3	GND	4	GND
5	LVDS YAM0	6	LVDS YAM1
7	LVDS YAP0	8	LVDS YAP1
9	GND	10	GND
11	LVDS YAM2	12	LVDS CLKAM
13	LVDS YAP2	14	LVDS CLKAP
15	GND	16	GND
17	NC0	18	LVDS YBM0
19	N/C	20	LVDS YBP0
21	GND	22	GND
23	LVDS YBM1	24	LVDS YBM2
25	LVDS YBP1	26	LVDS YBP2
27	GND	28	GND
29	LVDS CLKBM	30	N/C
31	LVDS CLKBP	32	N/C
33	N/C	34	+12V
35	N/C	36	+12V
37	N/C	38	VCC LCD
39	LCD BKL	40	VCC LCD



- **JP1: Panel Voltage Select**

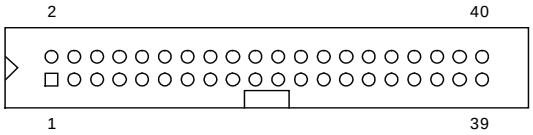
Options	Settings
+5V	Short 2-3
+3.3V (default)	Short 1-2

3.8 PCI E-IDE Drive Connector

IDE1 is a standard 40-pin 2.54-pitch connector daisy-chain driver connector serves the PCI E-IDE drive provisions onboard the 2807970.
A maximum of two ATA/33/66/100 IDE drives can be connected to the 2807970 via *IDE1*.

- **IDE1: IDE Connector**

PIN	Description	PIN	Description
1	IDERST	2	GND
3	PDD7	4	PDD8
5	PDD6	6	PDD9
7	PDD5	8	PDD10
9	PDD4	10	PDD11
11	PDD3	12	PDD12
13	PDD2	14	PDD13
15	PDD1	16	PDD14
17	PDD0	18	PDD15
19	GND	20	N/C
21	PDDREQ	22	GND
23	IOW#	24	GND
25	IOR#	26	GND
27	PIORDY	28	GND
29	PDDACK#	30	GND
31	IRQ14	32	N/C
33	PDA1	34	GND
35	PDA0	36	PDA2
37	Chip Select 0	38	Chip Select 1
39	HDD Active	40	GND



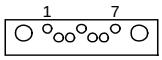
3.9 Serial ATA Connector

These SATA connectors supports Serial ATA II. Each SATA connector can only support one serial ATA device.

With most storage devices, there is a power cable that you need attach to a power source (power supply).

- **SATA1/SATA2: Serial ATA Connector**

PIN	Description
1	GND
2	SATATXP
3	SATATXN
4	GND
5	SATARXN
6	SATARXP
7	GND

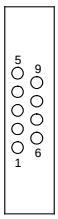


3.10 Serial Port Connectors

The 2807970 offers NS16C550 compatible UARTs with Read/ Receive 16-byte FIFO serial ports.

- **CN2: COM 1/COM 2 Connector (DB9)**

PIN	Description	PIN	Description
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	GND		



- **CN18/CN19: COM 2/COM 3 Connector (5x2 Header)**

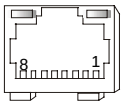
PIN	Description	PIN	Description
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8	RI
9	GND	10	VCC

3.11 Ethernet Connector

The 2807970 provides two external RJ-45 interface connectors. Please refer to the following for its pin information.

- **CN5A/CN6A: RJ-45 Connector**

PIN	Description
1	MDI0+
2	MDI0-
3	MDI1+
4	MDI1-
5	MDI2+
6	DMI2-
7	MDI3+
8	MDI3-



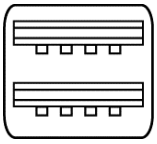
3.12 USB Port

The 2807970 provides eight USB ports at *CN6B/CN5B/CN12/CN11*.

If you are using a USB2.0 device with WIN2000/XP, you will need to install the USB2.0 driver from the Microsoft® website. If you are using Service Pack 1 (or later) for Windows® XP, and using Service Pack 4 (or later) for Windows® 2000, you will not have to install the driver.

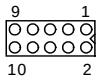
- **CN5B/CN6B: External USB Port**

PIN	Description	PIN	Description
1	VCC	2	VCC
3	USBD0-/USB2-	4	USBD1-/USB3-
5	USBD0+/USB2+	6	USBD1+/USB3+
7	GND	8	GND



- **CN12/CN11: Internal USB Port**

PIN	Description	PIN	Description
1	VCC	2	VCC
3	USBD4-/USBD6-	4	USBD5-/ USBD7-
5	USBD4+/USBD6+	6	USBD5+/ USBD7+
7	GND	8	GND
9	N/C	10	N/C



3.13 CMOS Data Clear

The 2807970 has a Clear CMOS jumper on *JP2.*

- **JP2: Clear CMOS**

Options	Settings
Normal Operation (default)	Short 1-2
Clear CMOS	Short 2-3

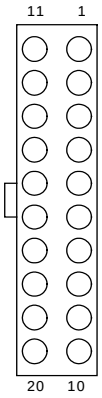
IMPORTANT: *Before you turn on the power of your system, please set JP2 to Short 1-2 for normal operation.*

3.14 Power and Fan Connectors

2807970 provides one 20-pin ATX power in at *CN16*.

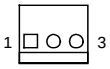
- **CN16: 20-pin ATX Power In Connector**

PIN	Description	PIN	Description
1	+3.3V	11	+3.3V
2	+3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	N/C	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V



- **CN14/CN15: Fan Power In Connector**

PIN	Description
1	GND
2	+12V
3	Fan Speed Control



- **JP3: Auto Power On Enabled/Disabled Select**

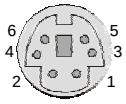
Options	Settings
Disabled (default)	Open
Enabled	Short

3.15 Keyboard/Mouse Connectors

The 2807970 offers two possibilities for keyboard/mouse connections. The connections are via *CN3* for two external PS/2 type keyboard/mouse or via *CN7* for an internal 6-pin cable converter to a keyboard/mouse.

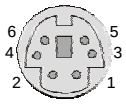
- **CN3: PS/2 6-pin Mini DIN Mouse Connector**

PIN	Description
1	Mouse Data
2	N/C
3	GND
4	+5V
5	Mouse Clock
6	N/C



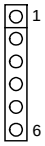
- **CN3: PS/2 6-pin Mini DIN Keyboard Connector**

PIN	Description
1	Keyboard Data
2	N/C
3	GND
4	+5V
5	Keyboard Clock
6	N/C



- **CN7: 6-pin Keyboard/Mouse Connector**

PIN	Description
1	Mouse CLK
2	Mouse Data
3	Keyboard CLK
4	Keyboard Data
5	GND
6	VCC



3.16 System Front Panel Control

The 2807970 has front panel control at location *CN21* that indicates the power-on status. CN21(1-3-5-7-9) is IrDA, CN21(13-15) is HDD LED, CN21(17-19) is TB LED, CN21(23-25) is power on, CN21(2-4) is reset button, CN21(8-10-12-14) is speaker, CN21(18-20-22) is power LED, CN21(24-26) is KBLOCK.

- **CN21: System Front Panel Control**

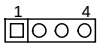
PIN	Description	PIN	Description
1	+5V	2	RESET+
3	N/C	4	RESET-
5	IRRX	6	----
7	GND	8	SPEAKER
9	IRTX	10	BUZZ
11	----	12	GND
13	HDLED+	14	+5V
15	HDLED-	16	
17	N/C	18	PWLED+
19	GND	20	N/C
21	----	22	PWLED-
23	PWRBT+	24	KBLOCK
25	PWRBT-	26	GND

3.17 Audio Connectors

The 2807970 has an onboard AC97 3D audio controoler. The following tables list the pin assignments of the Line In/Audio Out connector.

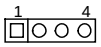
- **CN8: CD In Connector**

PIN	Description
1	CD L
2	GND
3	GND
4	CD R

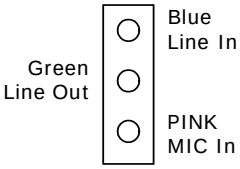


- **CN9: Line Out Connector**

PIN	Description
1	LOUT L
2	GND
3	GND
4	LOUT R



- **CN1: External Audio Connector**



3.18 CompactFlash™ Connector

The 2807970 also offers a Type I/II CompactFlash™ connector which is IDE interface located at the solder side of the board at location *CFII.*

3.19 Expansion Slot

The 2807970 offers one x1 PCI-E slot at *PCIEX1*, one standard PCI slot at *PCI*.

3.20 8-bit Digital I/O Function

The 2807970 offers one 8-bit digital input/output port.

- **CN20: 8-bit Digital Input/Output**

PIN	Description	PIN	Description
1	EXT VDD	2	I1
3	O1	4	I2
5	O2	6	I3
7	O3	8	I4
9	O4	10	EXT VSS

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

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