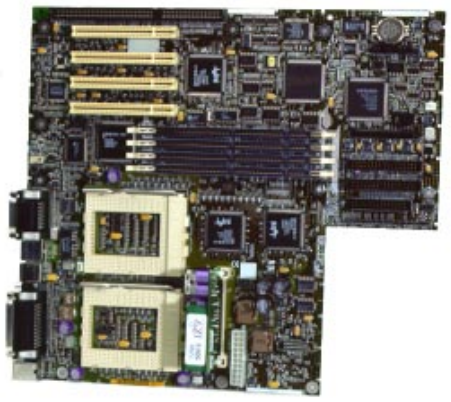
Model 686MBPR Series

Dual Pentium PRO Motherboard



DESCRIPTION

The PR440FX motherboard supports 2.1 V to 3.5 V Intel Pentium Pro processors. The board has a Socket 8 type socket for a second Pentium Pro processor. An onboard voltage regulator provides the required voltages for the primary processor socket; the voltages are from the +5 V and +3.3 V taps of the power supply. For dual processor configurations, a second Voltage Regulator Module (VRM) is supplied to provide power to the second processor.

The Pentium Pro processor integrates a second-level (L2) cache and cache controller. The motherboard supports 200 MHz processors with 256 KB or 512 KB internal non-blocking, L2 cache. The Pentium Pro processor maintains full software backward compatibility with the 8086, 80286, Intel386 ™ , Intel486 ™ and Pentium processors. It also has a numeric coprocessor that significantly increases the speed of floating point operations and complies with ANSI/IEEE standard 754-1985. Because of the processing power, however, it is recommended that the Pentium Pro be utilized with a full 32 bit operating system such as Windows NT.

The dual processor support for the PR440FX system consists of:

- Two Socket 8 ZIF sockets for installation of one or two Pentium Pro processors
- Voltage Regulator Module (VRM) for the second Pentium Pro processor or Pentium Pro OverDrive ™ (included with the dual processor Configuration)

FEATURES

- ***Single or Dual Pentium Pro Processors at 200MHz***
- ***Custom ATX Form Factor***
- ***Two 387-Pin, Socket 8 Type Processor Sockets***
- ***Four DIMM Sockets For Up To 512 MB Of Maximum Memory (With 128 MB Buffered ECC EDO Dimms)***
- ***256 KB Or 512 KB Second-Level Cache Memory In Pentium Pro Processor***
- ***Two Universal Serial Bus (USB) Interfaces***
- ***Three PCI Slots And One ISA/PCI Shared Slot***
- ***Intel Etherexpress(Tm) PRO/100B PCI LAN Subsystem***
- ***Adaptec 7880 SCSI Controller***
- ***Crystal CS4236 Audio Subsystem***
- ***Desktop Management Interface (DMI) Included In BIOS***

DESCRIPTION CONT.

Caution

Processors on the same motherboard must be identical stepping, speed, and L2 cache size.

The motherboard has four 168-pin ECC DIMM sockets for adding memory. The sockets support 2 MB x 72 (16 MB), 4 MB x 72 (32 MB), 8 MB x 72 (64 MB) and 16 MB x 72 (128 MB) buffered asynchronous EDO ECC DIMM modules only. Minimum memory size is 16 MB and maximum size is 512 MB. Motherboard supports both 50 ns and 60 ns memory modules. Each socket provides a 72-bit wide data path. Gold leaded DIMMs are recommended when adding system memory in order to avoid electrical corrosion problems.

The motherboard has two USB ports. This permits direct connection of two USB peripheral without an external hub. If more devices are required, an external hub can be connected to either port. The motherboard supports the standard Universal Host Controller Interface (UHCI). Features of the USB include:

- Hot Pluggable
- Self-Identifying Peripherals
- Automatic Mapping Of Function To Driver And Configuration
- Support For Isochronous And Asynchronous Transfer Types Over The Same Set Of Wires
- Support For Up To 127 Physical Devices
- Guaranteed Bandwidth And Low Latencies Appropriate For Telephony, Audio, And Other Applications
- Error Handling And Fault Recovery Mechanisms Built Into The Protocol

The motherboard has two independent high-performance bus-mastering PCI/IDE interfaces capable of supporting PIO Mode 3, PIO Mode 4, and ATAPI devices. The system BIOS supports Logical Block Addressing (LBA) and Extended Cylinder Head Sector (ECHS) translation modes. The IDE device transfer rate and translation mode capability is automatically determined by the system BIOS.

Normally, programmed I/O operations require a substantial amount of processor bandwidth. In true multitasking operating systems like Windows NT, the processor bandwidth freed by using bus mastering IDE can be used to complete other tasks while disk transfers are occurring. When used in conjunction with the appropriate driver for the operating system, the IDE interface can operate as a PCI bus master capable of supporting PIO Mode 4 devices with transfer rates of up to 16 MB/sec.

The system I/O is incorporated into a single device - the PC87308 is a Plug and Play device that features:

- Two NS16C550-Compatible Uarts With Send/ Receive 16-Byte FIFO
- Support For An Irda Transmitter/Receiver
- Multi-Mode Bi-directional Parallel Port
- Standard Mode; IBM And Centronics Compatible
- Enhanced Parallel Port (EPP) With BIOS/ Driver Support
- High Speed Mode; Extended Capabilities Port (ECP) Compatible
- Industry Standard Floppy Controller With 16-Byte FIFO (2.88 MB Floppy Support)
- Integrated Real Time Clock With Century Calendar Functionality
- Integrated 8042-Compatible Keyboard Controller

PS/2 keyboard/mouse connectors are located on the back panel side of the motherboard. The 5V lines to these connectors are protected with a PolySwitch circuit which acts much like a self-healing fuse, re-establishing the connection after an over-current condition is removed. While this device eliminates the possibility of having to replace a fuse, take care to turn off the system power before installing or removing a keyboard or mouse.

A 25-pin D-Sub header is provided on the back panel for a multi-mode bi-directional parallel port. The parallel port operates in standard mode, EPP version 1.7 mode (BIOS and driver support) or a high speed ECP compatible mode. EPP Mode requires a driver provided by the peripheral manufacturer to operate correctly.

The motherboard provides an embedded Adaptec AIC-7880SCSI host adapter as a factory installed option. The AIC-7880 contains a double-speed SCSI controller and a PCI bus master interface. The AIC-7880 supports:

- 8- Or 16-Bit Fast SCSI Providing 10 MB/Sec Or 20 MB/Sec Throughput, Or
- Double-Speed SCSI That Can Burst Data At 20 MB/Sec Or 40 MB/Sec

As a PCI 2.1 bus master, the AIC-7880 supports burst data transfers on the PCI bus up to the maximum rate of 133 MB/sec using the on-chip 256-byte FIFO. For greatest performance, SCSI device support is focused on 16-bit wide fast SCSI devices. Although 8-bit SCSI devices are supported, due to space constraints a legacy 50 pin SCSI header is not provided. To support 8-bit SCSI devices, a 68-to 50-pin adapter is required.

DESCRIPTION CONT.

The motherboard features a 16-bit stereo audio subsystem as a factory installed option. The audio subsystem is based upon the Sound Blaster compatible Crystal CS4236 multimedia codec. The CS4236 provides the digital audio and analog mixing functions required for playing and recording audio on personal computers including:

- Stereo Analog-To-Digital And Digital-To-Analog Converters
- Analog Mixing, Anti-Aliasing And Reconstruction Filters
- Line And Microphone Level Inputs
- Digital Audio Compression Using Selectable A-Law Or Mlaw Rules
- Full Digital Control Of All Mixer And Volume Control Functions

With the integrated Sound Blaster OPL3 compatible FM synthesizer, the CS4236 also provides support for four major sound standards including Adlib and Sound Blaster Pro 2.0, Windows Sound System and MPU-401 to meet all of the requirements of today's multimedia applications. The CS4236 also supports full-duplex operation to support future applications such as video conferencing.

SPECIFICATIONS

Processors Supported

Pentium Pro 256k or 512k Cache
256k Cache model includes fan with tachometer sensor output
Single or Dual Processor configurations

BIOS

Intel 2Mbit Flash
Win/NT Ready
APM 1.2, IDE Auto-Configure
Multi-processing Support

Chip Set

Intel 440FX PCI Set

Memory Capacity

512MB Maximum

DIMM Support

Four Banks, One 168 pin Socket each
Gold lead, 3.3V, Buffered, 60ns EDO memory required
72 bit DIMMs must be used for ECC support

DIMM Sizes

16MB, 32MB, 64MB, 128MB

Expansion Slots

Three PCI and One ISA/PCI Shared

LAN Controller (On PCI Bus)

Intel 82557 (EtherExpress Pro/100B

LAN Performance

10/100 Mb/s data transfer rates

Ultra/Wide SCSI-3 Controller (On PCI Bus)

Adaptec 7880

SCSI Performance

40MB/s Maximum Throughput

Number of SCSI Devices Supported

Up to 15 Wide or 7 Narrow Devices

SCSI Connector

On-board mini 68 pin 16-bit wide
External mini 68 pin16-bit wide connector on riser card

EIDE Controller (on PCI Bus)

Two channels, two devices each, Bus Mastering

IDE Device Types Supported

Mode 0, PIO Mode 3, PIO Mode 4 (16MB/s)

Audio Controller

Crystal 4236 Codec

Audio Specifications

FM Synthesizer, Full Duplex Enabled
8 pin Wave Table header
Rear Panel Connections for mic-in, line-in and stereo-out
4 pin CD-ROM audio header
4 pin header for modem audio connection
15 pin MIDI/Joystick Connection

I/O Controller

National "Super I/O"

Serial Ports

Two, 16C550 Compatible, Async, RS232

Parallel Port

IEEE 1284 Compatible, ECP, EPP

SPECIFICATIONS CONT.

Floppy Controller

Two device, 360k to 2.88MB, 3 mode support
Keyboard Controller
8042 Compatible

I/O Panel Requirements

Intel Core #3

DC Voltage Requirements

Minimum 200W ATX power supply for typical configurations
+5 V ±5 %
-5 V ±5 %
-12 V ±5 %
+3.3V ±3 %

Dimensions

"Custom" ATX
12" x 13" with a 3.5" x 5.25" Notch
(30.5 x 33.0 and 8.9 x 13.3cm)

ENVIRONMENTAL

Temperature

Operating	+0ºC to +55ºC
Non-Operating	-40ºC to +70ºC

Humidity

5-92% R.H.N.C. @ 36ºC

Airflow Requirements

100 LFM

Vibration

- Unpackaged 5 Hz to 20 Hz : 0.01g² Hz sloping up to 0.02 g² Hz
- 20 Hz to 500 Hz : 0.02g² Hz (flat)
- Packaged 10 Hz to 40 Hz : 0.015g² Hz (flat)
- 40 Hz to 500 Hz : 0.015g² Hz sloping down to 0.00015 g² Hz

MTBF

>110,000 P.O.H. Calculated from predicted data @ 55C.

Agency Approvals

UL, c-UL, CE, FCC Class B

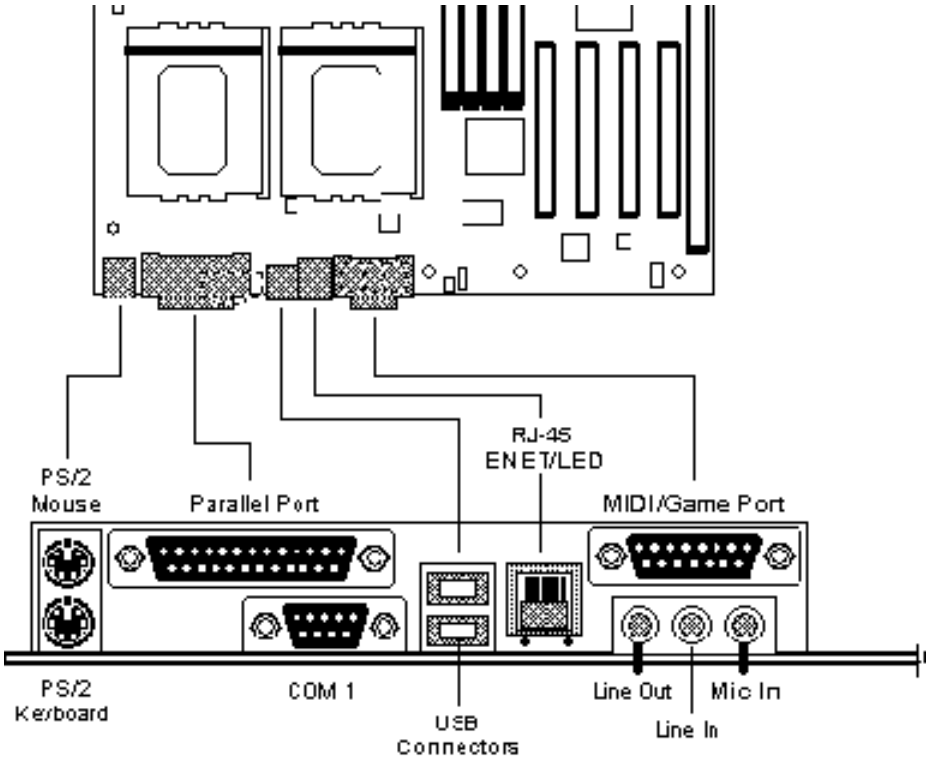


Figure 1 I/O Port Connections

ORDERING GUIDE

Model 686MBPR200

Motherboard, Single 200MHz Pentium Pro 256k Cache Processor

Model 686MBPR200D

Motherboard, Dual 200MHz Pentium Pro 256k Cache Processors

Model 686MBPR5200

Motherboard, Single 200MHz Pentium Pro 512k Cache Processor

Model 686MBPR5200D

Motherboard, Dual 200MHz Pentium Pro 512k Cache Processors

Model 41924-12A

I/O Panel, Core #3, for 7308T/7408T Chassis
Note: *The 686MBPR motherboard is a "custom" ATX layout, exceeding the normal maximum dimensions and consequently fits into a limited number of chassis.*

MEMORY DIMMS

Model TMS-20072-60

16MB, ECC, 3.3V Buffered DIMM

Model TMS-40072-60

32MB, ECC, 3.3V Buffered DIMM

Model TMS-80072-60

64MB, ECC, 3.3V Buffered DIMM

Model TMS-16072-60

128MB, ECC, 3.3V Buffered DIMM