



BX400ii Interposer Board

User's Manual

March 29, 2000

Order Number: [273224-003](#)





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1.0 Introduction

This document introduces the BX400ii Interposer Board and provides installation instructions.

The BX400ii Interposer Board with the Intel® Mobile Pentium® II Processor emulates the functionality of the Intel® Pentium® II Processor Mobile Module to provide a bus interconnect for emulation and logic analysis tools. This board is used for Intel Pentium II Processor Mobile Module system designs.

Note: Due to additional signal loading and trace lengths, the BX400ii Interposer Board may not function in all system designs.

1.1 Key Terms

LPM refers to the Intel® Low Power Pentium® II Processor module. This module is identical to the Intel Pentium II Processor Mobile Module Connector (MMC-2). A complete description of this module is located in the *Intel® Pentium® II Processor Mobile Module: Mobile Module Connector 2 (MMC-2)* datasheet (<http://developer.intel.com/design/mobile/datashts>).

82443BX refers to the Intel 82443BX Host Bridge Controller.

1.2 Related Documents

Table 1. Related Documents

Document	Order #
<i>Intel® Pentium® II Processor Mobile Module: Mobile Module Connector 2 (MMC-2)</i> datasheet	243668
<i>Intel® Pentium® II Processor at 233 MHz, 266 MHz and 300 MHz</i> datasheet	243669
<i>Mobile Pentium® II Processor Specification Update</i>	243887
<i>Intel® 440BX AGPset: 82443BX Host Bridge/Controller</i> datasheet	290633

Table 2. Vendor Reference[†]

Vendor Name	Contact Information
American Arium	(714) 731-1661 http://www.arium.com/aaproduct.htm
Applied Microsystems Corporation	(800) 426 3925 http://www.amc.com
Hewlett Packard	(800) 452-4844 http://www.tmo.hp.com
Microtek International	(800) 886-7333 http://www.microtekintl.com
Tektronix	(800) TEK-WIDE http://www.tek.com
Ironwood Electronics (for adapters only)	(800) 404-0204 http://www.ironwoodelectronics.com

[†] Intel does not endorse or recommend third-party vendors.

1.3 **Pentium® II Processor Mobile Module: Mobile Module Connector 2 or Low Power Pentium II Processor Module**

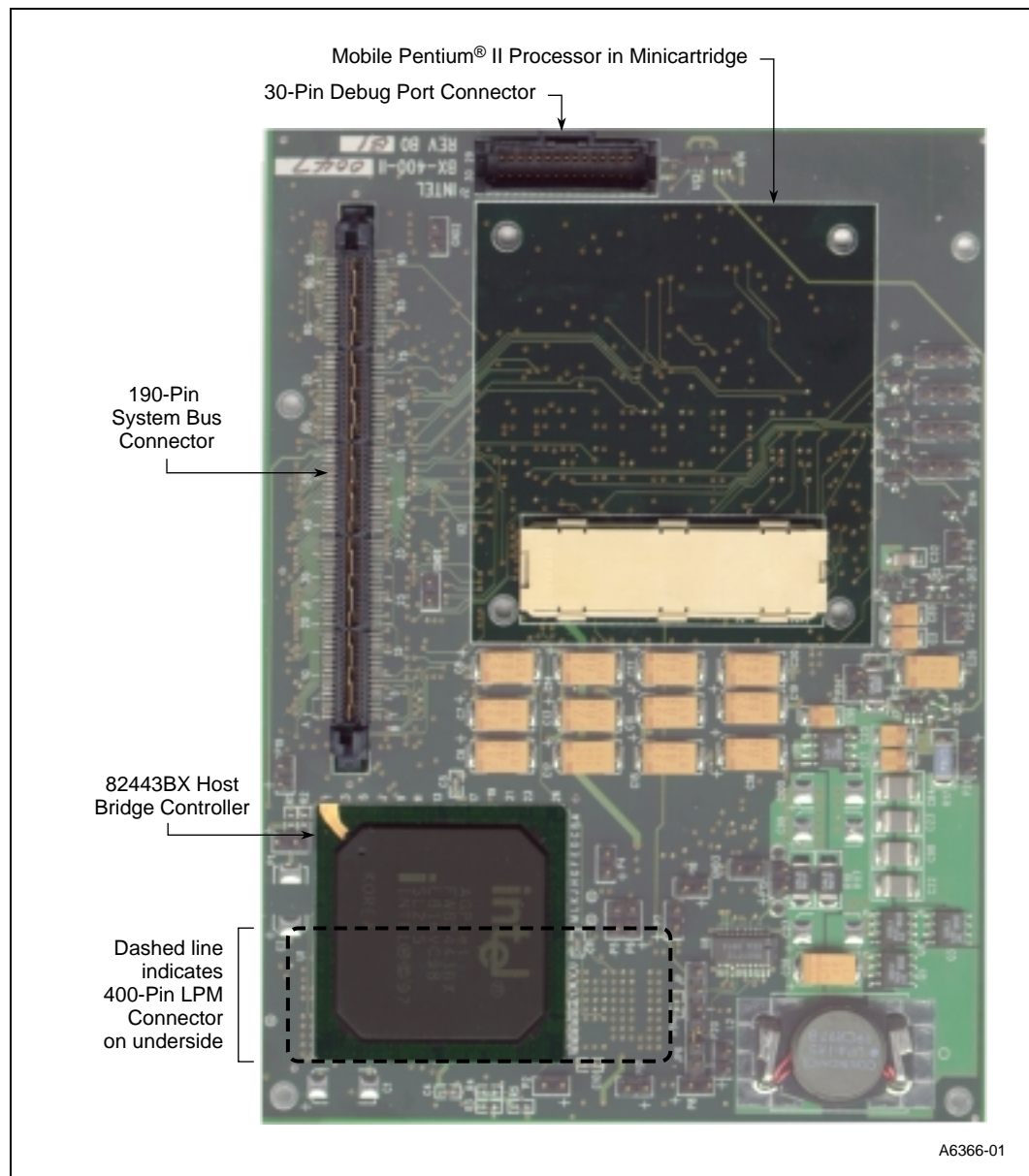
The Pentium II Processor Mobile Module: Mobile Module Connector 2 (400-pin MMC-2) or Low Power Pentium II Processor Module (LPM) is a small, highly integrated assembly containing an Intel Pentium II processor and its immediate system-level support. Specifically, the processor module contains a power regulator, level 2 (L2) cache memory, and the core logic required to bridge the processor to standard system buses. The module interfaces electrically to its host system via a 3.3 V PCI bus, a 3.3 V memory bus and some Intel 82443BX Host Bridge Controller signals. Refer to [Table 1](#) for a list of related documents.

1.4 **BX400ii Interposer Board Features**

The BX400ii Interposer Board contains the same system level support provided by the Pentium II processor mobile module with a few exceptions.

- It includes a 240-pin connector for the Mobile Pentium II processor in mini-cartridge
- It provides two additional interfaces for debug tools:
 - 30-pin debug port connector
 - 190-pin processor system bus connector

Figure 1. Top View of BX400ii Interposer Board Assembly



The same 400-pin system interface is still provided to allow connection to the target system. In addition, a top side 240-pin connection is added for the Intel Mobile Pentium II Processor in mini-cartridge. This processor, plus the BX400ii Interposer Board, provides compatible functionality with the Pentium II processor Mobile Module.

The 30-pin debug port connector connects to the run control cable, or debug port, of the emulator or logic analyzer. The 190-pin processor system bus connector connects directly to the emulator or logic analyzer bus preprocessor. This connection allows for full bus trace and triggering. Contact your emulator or logic analyzer vendor for specific tool capabilities. See [Table 2](#) for a reference list of vendors.

1.5 BX400ii Interposer Board Dimensions

This section provides the physical dimensions for the BX400ii Interposer Board.

Note: Notice in [Figure 2](#) the mechanical clearance requirements for the BX400ii Interposer Board compared to the Low Power Module (LPM).

Figure 2. BX400ii Keepout Space Requirements

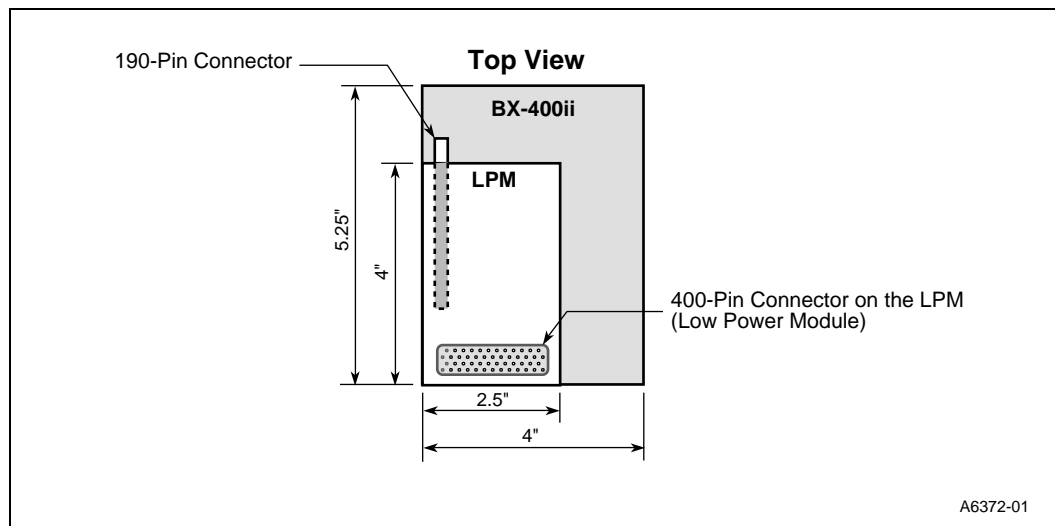
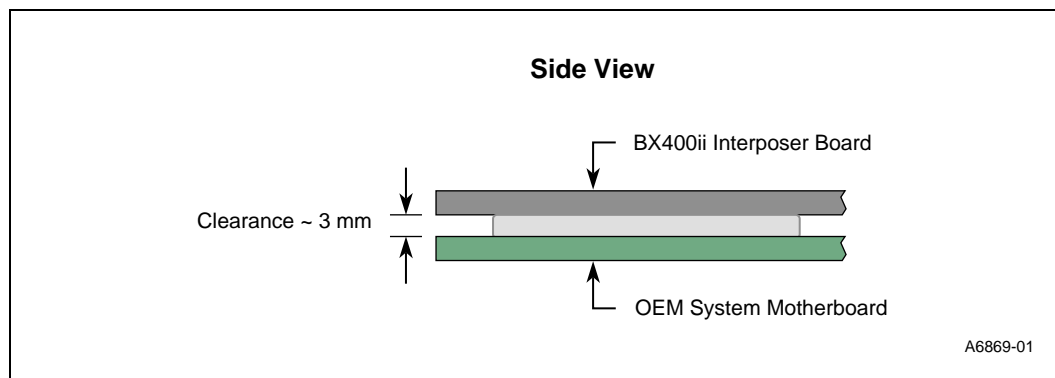


Figure 3. BX400ii Connector Clearance



The clearance between the BX400ii Interposer Board and the OEM system board is approximately 3 mm as shown in [Figure 3](#). If additional clearance is required, a socket saver can be used adding approximately 8 mm of additional clearance. Contact your Intel Field Sales Representative or a tools vendor to request a socket saver.

2.0 Getting Started

The BX400ii Interposer Board requires a Mobile Pentium II Processor in mini-cartridge at a frequency corresponding to the mobile module that is being emulated.

2.1 Unpacking Instructions

Carefully unpack the contents of the box and verify that all of the items in the packing list are present. If items are missing or damaged, contact Intel or your authorized distributor.

2.1.1 Important Static Electricity Precautions

Take appropriate measures to prevent static electricity damage when removing the Interposer Board from the antistatic bag. This board should only be handled in a static free area.

- Before handling any components or touching any other system units, discharge your body's static electric charge by touching a grounded surface.
- Wear a grounded wrist strap if one is available.
- Remove the board from the antistatic bag **only when** you are ready to install it.
- Do not lay the board or other components on the bag, only the insides are antistatic.
- When handling the board or other components, hold them by their edges or metal mounting brackets.
- Never slide the board or other components over any surface.

2.2 Installation

Pay careful attention when installing the 400-pin high density connectors. Successful module insertion and extraction consists of 3 major elements:

1. **Alignment** - Rough alignment is required before applying forces to reduce the possibility of contact damage. Fine alignment is provided by the connector housing. Rough alignment is achieved by visually aligning the connector housing and mounting holes.
2. **Insertion** - Insertion forces must be applied only on the board surface. Do not apply force to any component. Best results and lower insertion forces are achieved when using a 2-step rolling or "zippering" process. Align the connector length wise from one end of the connector, roll the connector on until the board/module/mini-cartridge is parallel, and then apply force straight down to secure the connector.
3. **Extraction** - Extraction forces must be applied while securely controlling the board. Rolling out the connector opposite of the insertion process is recommended. Twisting the board or excessively tilting it while removing can result in connector damage.

2.2.1 BX400ii

The BX400ii Interposer Board, with the processor securely mounted on top of it, replaces the mobile module in the system. First, remove the mobile module and its associated mounting hardware, then carefully install the BX400ii Interposer Board on the 400-pin connector.

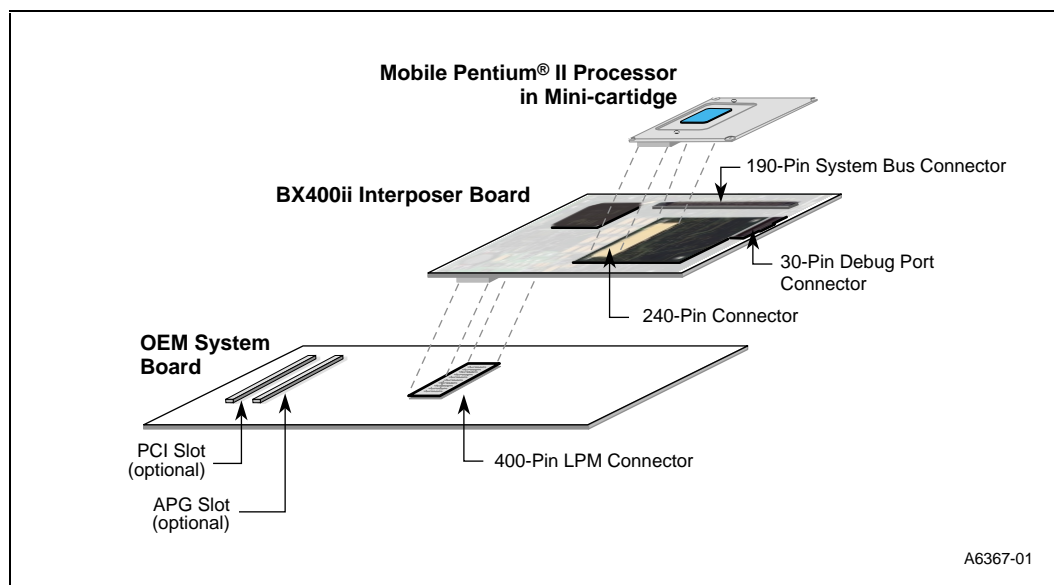
Note: Please consider the thermal requirements of your Mobile Pentium II processor and ensure that the proper thermal management solution is in place.

2.2.2 Emulator/Logic Analyzer

Connect the 30-pin cable from the emulator or logic analyzer to the debug port connector on the BX400ii Interposer Board. If you have a debug port designed into your system, only the debug port on the BX400ii Interposer Board will function. The port on the system board will not function with the BX400ii in place.

Connect the probe from the Mobile Pentium II processor logic analyzer to the 190-pin connector. Contact your logic analyzer vendor for specific details. A list of some third-party vendors is available in [Table 2 on page 5](#).

Figure 4. BX400ii Interposer Board Stack Mounting



3.0 Hardware Reference

For a hardware layout of the BX400ii Interposer Board, refer to [Figure 5 on page 13](#). For board dimensions and keepout space requirements, refer to [Figure 2](#) and [Figure 3 on page 8](#).

3.1 Connector Definitions

Changes to the hardware are not required for the BX400ii Interposer Board. If necessary, you can refer to the *Mobile Pentium® II Processor at 233 MHz, 266 MHz and 300 MHz* datasheet (order number 243669), *Intel® Pentium® II Processor Mobile Module: Mobile Module Connector 2 (MMC-2)* datasheet (order number 243668) for connector definitions.

3.2 Jumper Settings

Changes to the jumper settings are not required for normal operation of the BX400ii Interposer Board.

3.2.1 Voltage Regulator Settings

The voltage setting for the V_{CC} core is determined by the VID pins, which are signal outputs of the Mobile Pentium II processor. Jumper settings are available to vary the V_{CC} core voltage, however, these should only be used for validation/debug purposes. For reference purposes, the jumper settings for the voltage regulator are provided in [Table 3](#).

Table 3. Voltage Regulator Jumper Settings

JP1	JP2	JP3	JP4	+VCC_CPU
NS	NS	NS	NS	1.25 V
NS	NS	NS	1-2	1.30 V
NS	NS	1-2	NS	1.35 V
NS	NS	1-2	1-2	1.40 V
NS	1-2	NS	NS	1.45 V
NS	1-2	NS	1-2	1.50 V
NS	1-2	1-2	NS	1.55 V
NS	1-2	1-2	1-2	1.60 V
1-2	NS	NS	NS	1.65 V
1-2	NS	NS	1-2	1.70 V
1-2	NS	1-2	NS	1.75 V
1-2	NS	1-2	1-2	1.80 V
1-2	1-2	NS	NS	1.85 V
1-2	1-2	NS	1-2	1.90 V
1-2	1-2	1-2	NS	1.95 V
1-2	1-2	1-2	1-2	2.00 V

NOTE: 1-2 = Populate Jumper, NS = No Shunt.

3.3 Test Points

Power measurement header descriptions are provided in [Table 4](#).

Table 4. Power Measurement Header Descriptions

Header	Voltage Rail	Resistor	Effective Resistance (Ω)	Description
P1	+VGTLREF_BX (5/9 VTT)	R28	0.01	GTL reference voltage for 440BX
P2	+V3_AGPREF (3.3V)	R45	0.01	3.3 V rail for 440BX AGPset: 82443BX reference
P5, P6	+V3_BX (3.3V)	R57	0.01	3.3 V rail for BX core
P7	+V3_PU (3.3V)	R58	0.01	3.3 V rail for pull-ups
P8	+V3_VR (3.3V)	R59	0.01	3.3 V rail for voltage regulator subsystems
P15	+VTT MPIO (1.6V)	R10, R117	0.0005	Core Processor Voltage
P16	+ VTT_BX	R90	0.01	Low Power GTL +voltage rail for 443BX Host Bus interface pins
P17	+V CPUIO (2.5V)	R97	0.01	2.5V used for clock on system electronics and pullup voltage for CPU cmos compatibility signals
P19	+VTT_GTL_PU	R101	0.01	Low Power GTL +voltage rail for all GTL termination resistors and 443BX GTL reference
P20	+ V5_VTT (5V)	R75	1.0	5 V input to Voltage Regulator subsystem generating core VTT to the CPU
P21	+ VIN (4.75V - 21V)	R17	0.025	Primary DC system power supply [4.75 V-21 V] from system electronics board

Figure 5. BX400ii Board Layout Drawing

