# IBM Microelectronics 486DX2 Common Socket Specification For 168 PGA Socket



# **Application** Note

## Overview

This document provides detailed information regarding the differences in pinouts between IBM 486DX/DX2, Intel® SL Enhanced<sup>TM</sup> 486DX/DX2 and Intel 486DX4 PGA devices and specifies electrical connections that allow a single motherboard design to support all of the devices listed. This specification is intended to be a guideline to eliminate conflicts due to pinout differences and does not address register or electrical (AC/DC) differences that may exist.

This common socket specification is intended to support the following 486 devices:

IBM 486DX/DX2 IBM 486DX/DX2-V Intel SL Enhanced i486DX/DX2 IntelDX4

For additional 486DX/DX2 and 486DX/DX2-V information, please refer to the IBM 486DX/DX2 Data Book or contact IBM Microelectronics. Information in this document is subject to change without notification. The following documents were used as references for the Intel devices: SL Enhanced Intel486 Microprocessor Data Sheet Addendum, and IntelDX4 Processor Data Sheet. Any functions not disclosed in the referenced documents are NOT covered by the scope of this specification.

# **CPU Features**

Each of the CPU's supported in this common socket specification is 486 bus compatible yet has a unique set of features that impact the device pinout. Table 2-1 lists the differences in the CPU feature sets.

CPU	5 VOLT SUPPLY	3 VOLT SUPPLY (5 VOLT I/O)	WRITE- BACK CACHE	SMM	CPU POWER MANAGEMENT	CORE CLOCK CONTROL	JTAG
IBM 486DX/DX2	Х		Х	Х	Х		
IBM 486DX/DX2-V		Х	Х	Х	Х		
Intel I486DX/DX2 SL Enhanced	X			X	Х		X
Intel DX4		Х		Х	Х	Х	Х

 Table 2-1
 CPU Features

### **Pin Differences**

Table 3-1 lists those pins with signal assignments that are not consistent for all of the CPUs. Table 3-1 also specifies the appropriate connections for a common socket implementation. All pins that are not listed have identical signal assignments for all CPUs shown in the table. Therefore when implementing a common socket, all pins not listed should have identical connections to the system logic regardless of the CPU type.

		SIG			
PIN NUMBER	486DX, 486DX2	486DX-V 486DX2-V	i486DX, i486DX2 SL Enhanced	INTELDX4	COMMON SOCKET IMPLEMENTATION
A3	NC	NC	ТСК	ТСК	No connection unless JTAG supported
A10	SUS PA#	SUSPA#	NC	NC	Jumper block 1.
A12	SMI#	S MI#	NC	NC	Jumper block 2.
A13	RPLSET1	RPLSET1	NC	NC	Jumper block 1.
A14	NC	NC	TDI	TDI	No connection unless JTAG supported
B10	NC	NC	S MI#	SMI#	Jumper block 2.
B12	TEST	TEST	NC	NC	No connection
B13	WM RST	WM RST	NC	NC	Jumper block 3.
B14	NC	NC	TMS	TMS	No connection unless JTAG supported
B16	NC	NC	TDO	TDO	No connection unless JTAG supported
C10	SMADS#	SMADS#	SRESET	SRESET	Jumper block 3.
C12	RPLSET0	RPLSET0	SMIACT#	SMIACT#	Jumper block 3.
C13	RPLVAL#	RPLVAL#	NC	NC	No connection
G15	SUSP#	SUS P#	STPCLK#	STPCLK#	Connect to SUSP#/STPCLK# output from system logic.
R17	HITM#	HITM#	NC	CLKMUL	Jumper block 2.
S4	INVAL	INVAL	NC	VOLDET	Jumper block 1.
B7,B9,B11, C4,C5,E2,E16, G2,G16,H16, K2,K16, L16,M2, M16,P16, R3,R6,R8, R9,R10, R11,R14	Vcc=5V	Vec=3.3V	Vcc=5V	Vcc=3.3V	Connect to CPU Vcc output of power supply circuitry. CPU Vcc output of power supply circuitry should vary based on the VOLDET output of jumper block 1. All CPU Vcc pins should be connected in the board using a power plane. The CPU power plane should be electrically separated from the rest of the board's power plane so that the CPU can be powered independent of the system.
J1	Vcc=5 V	NC	Vcc=5V	Vcc5	For 5 V I/O logic, connect Vcc5 to 5 V. For 3 V I/O logic connect Vcc5 to 3.3 V.

#### Table 3-1 CPU Pin Assignment

A schematic for the common socket connections is shown in Figure 3-1. The corresponding jumper settings are listed in Table 3-2.



\* SMADS# and SMIACT# provide similar functionality and typically are assigned to the same pin. \*\* WM\_RST and SRESET provide similar functionality and typically are assigned to the same pin. \*\*\* SUSP# and STPCLK# provide similar functionality and typically are assigned to the same pin.

Table 5 2. Sumper Settings								
CPU	JUMPER BLOCK 1	JUMPER BLOCK	JUMPER BLOCK 3					
		2						
BL486DX/DX2	2-3, 4-5	2-3, 4-5	2-3, 4-5					
BL486DX/DX2-V	2-3, 4-5, 6-7	2-3, 4-5	2-3, 4-5					
i486DX/DX2	None	1-2	1-2, 3-4					
IntelDX4	5-6	5-6 for 2X core,	1-2, 3-4					
		7-8 for 2 5X core						

#### Table 3-2. Jumper Settings

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