

# PGA and QFP Pinout Offerings for the IBM 486 DX4 Microprocessor



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## *Application Note*

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Revision Summary: This is the initial release of this Application Note
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## Introduction

This paper explains which pinout options are available for the IBM 486 DX4 microprocessor and IBM's reasons for providing multiple pinouts in the same package.

The IBM 486 DX4 processor is being offered in one 208-pin CQFP (Ceramic Quad Flat Pack) package pinout and two 168-pin PGA (Pin Grid Array) package pinouts.

## Reasons For Providing Multiple PGA Pinouts

The IBM 486 DX4 is provided in two PGA pinouts:

1. **IBM 486 DX2** pinout (identical to the current IBM 486 DX2)
2. **Intel® 486DX4-like** pinout (Intel 486DX4-like pinout + Write-Back cache pins)

Either pinout is functionally equivalent, in fact both are built with identical chips.

The **IBM 486 DX2** pinout is being offered to allow current IBM 486 DX2 customers to easily upgrade to an IBM 486 DX4 microprocessor. No motherboard changes are necessary. A simple BIOS change may be required to recognize the DX4 processor-id, as it is different from the DX2.

The **IBM 486 DX4** pinout is being offered for new motherboard designs that support the Intel 486DX4 microprocessor. These motherboards must be capable of supporting the on-chip Write-Back L1 cache to gain maximum performance from the IBM 486 DX4. The addition of HITM# and INVAL are the two Write-Back pins which are unique to the IBM 486 DX4 and not present with the Intel 486DX4. The Intel P24D microprocessor includes the HITM# and INVAL pins as it supports Write-Back.

## CQFP Option

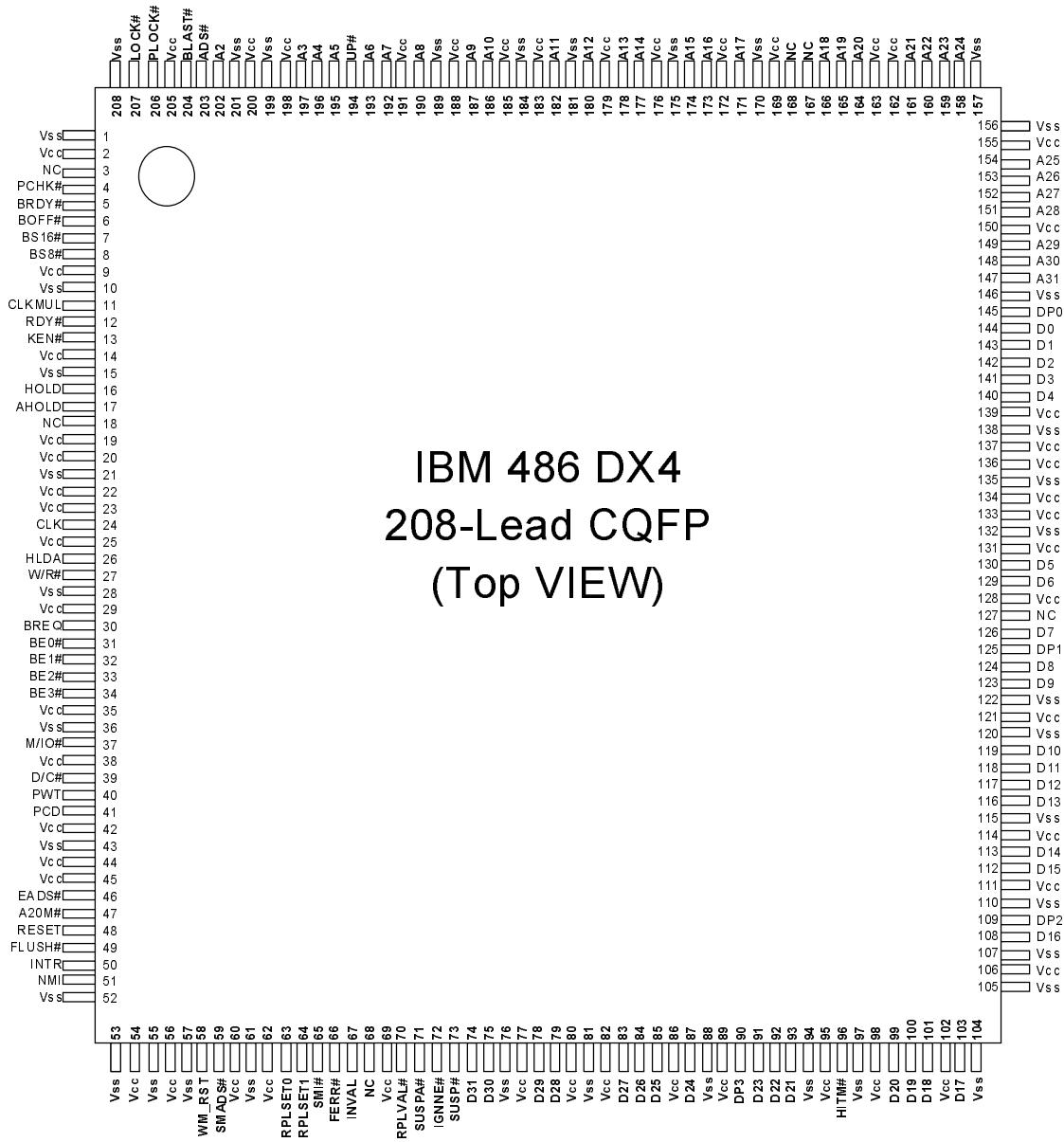
The pinout for the IBM 486 DX4 in a QFP package has only one additional functional pin versus the IBM 486 DX2 QFP product. The pin is #11 and its label is CLKMUL.

All technical data for this product can be found in the Blue Lightning 486 DX2 Databook and the IBM 486 DX4 Addendum to the databook.

The differences among the various IBM and Intel CQFP products are best summarized by the following table:

Pin #	IBM DX2	IBM DX4	Intel DX4	Intel P24D (Write-Back Enhanced DX2)
3	NC	NC	Vcc5	Vcc
11	NC	CLKMUL	CLKMUL	INC
18	NC	NC	TCK	TCK
58	WM_RST	WM_RST	SRESET	SRESET
59	SMADS#	SMADS#	SMIACT#	SMIACT#
63	RPLSET0	RPLSET0	NC	HITM#
64	RPLSET1	RPLSET1	NC	WB/WT#
67	INVAL	INVAL	NC	NC
68	NC	NC	TDO	TDO
70	RPLVAL#	RPLVAL#	NC	CACHE#
71	SUSPA#	SUSPA#	NC	INV
73	SUSP#	SUSP#	STPCLK#	STPCLK#
96	HITM#	HITM#	NC	NC
167	NC	NC	TMS	TMS
168	NC	NC	TDI	TDI

The following page contains the pinout assignments for the CQFP Package.



## PGA (IBM 486 DX2 Pinout) Option:

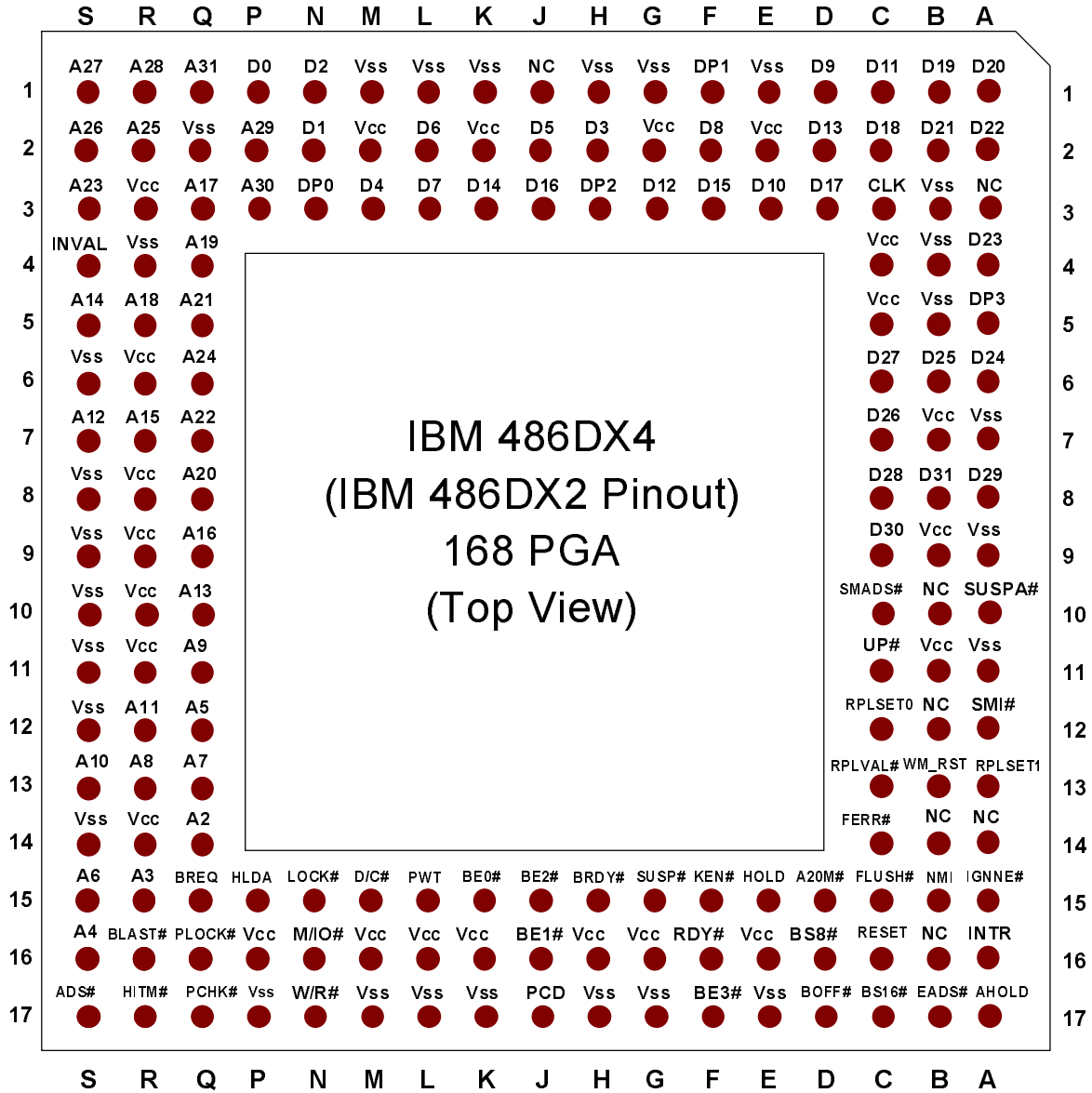
All technical data for this product can be found in the Blue Lightning 486 DX2 Databook and the IBM 486 DX4 Addendum to the databook.

The differences among the various IBM and Intel PGA products are best summarized by the following table:

Pin #	IBM DX2	IBM DX4 (IBM DX2 pin-out)	IBM DX4 (Intel DX4 pin-out, with W/B)	Intel DX4	Intel DX2 Write-Back Enhanced or P24D
A3	NC	NC	NC	TCK	TCK
A10	SUSPA#	SUSPA#	INVAL	INC	INV
A12	SMI#	SMI#	HITM#	INC	HITM#
A13	RPLSET1	RPLSET1	SUSPA#	INC	INC
A14	NC	NC	NC-(TDI)	TDI	TDI
B10	NC	NC	SMI#	SMI#	SMI#
B12	NC	NC	RPLSET1	INC	CACHE#
B13	WM_RST	WM_RST	RPLVAL#	INC	WB/WT#
B14	NC	NC	RPLSET0	TMS	TMS
B16	NC	NC	NC-(TDO)	TDO	TDO
C10	SMADS#	SMADS#	WM_RST	SRESET	SRESET
C12	RPLSET0	RPLSET0	SMADS#	SMIACT#	SMIACT#
C13	RPLVAL#	RPLVAL#	NC-(TEST)	NC	NC
G15	SUSP#	SUSP#	SUSP#	STPCLK#	STPCLK#
J1	NC	NC	NC	Vcc5	Vcc
R17	HITM#	HITM#	CLKMUL	CLKMUL	INC
S4	INVAL	INVAL	NC-(VSS)	VOLTDET	NC

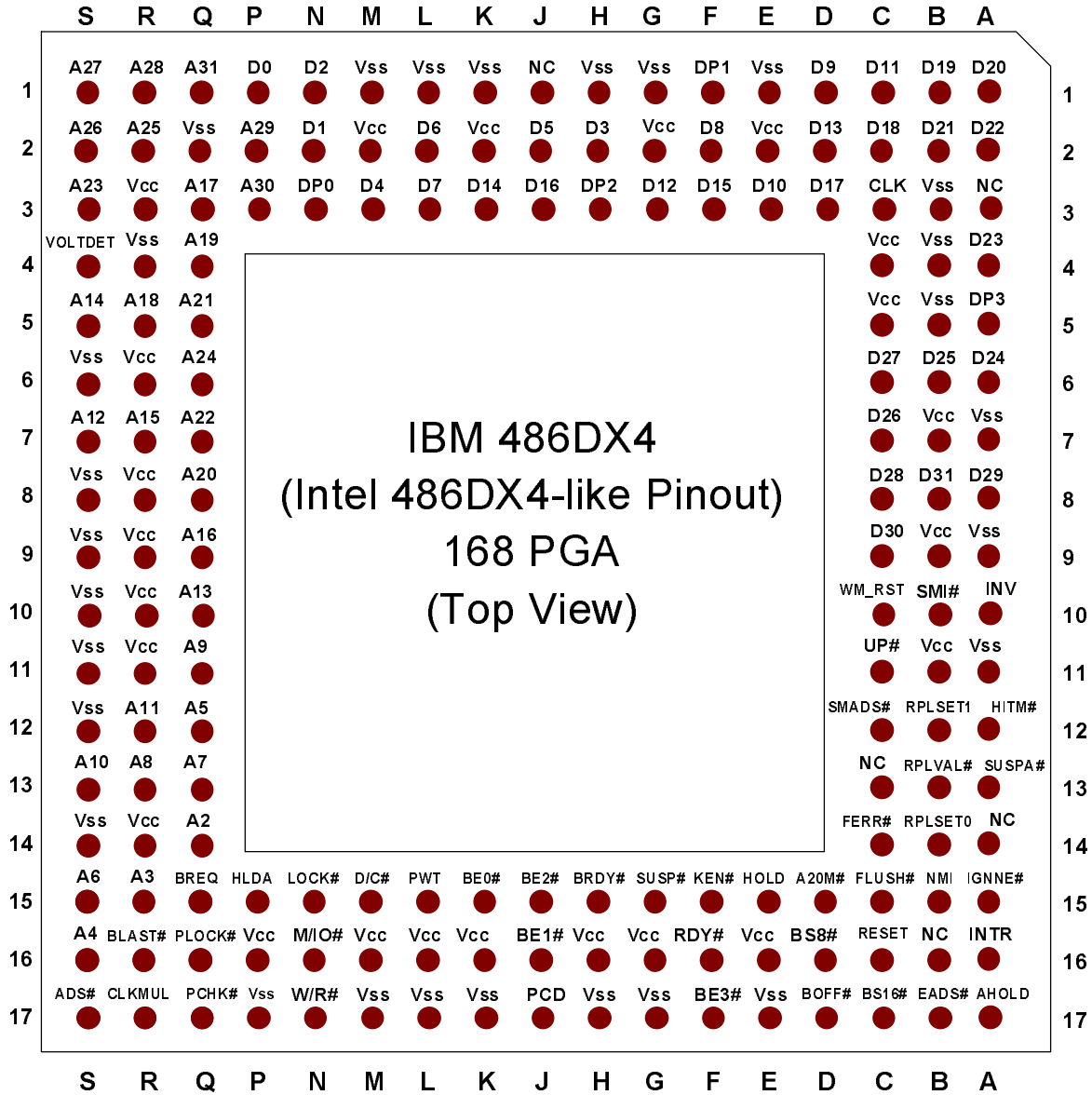
The following page contains the pinout assignments for the IBM DX2 PGA pinout option.

# PGA (IBM 486DX2 Pinout) Option



The following is the pin assignments for the IBM DX2 PGA pinout package:

# PGA (Intel 486DX4-like pinout) Option



The following is the pinout assignments for the Intel DX4 PGA pinout package:

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