

System Design Considerations



**Advanced
Micro
Devices**

Application Note

This application note provides guidelines for using standard Am486[®] microprocessors, Enhanced Am486 microprocessors, and AMD-X5[™] microprocessors in universal motherboard designs.

MULTIFUNCTIONAL SYSTEM DESIGNS

Advanced Micro Devices encourages the development of personal computer system board designs that incorporate multiple microprocessor types. This approach allows system designers to support microprocessors with different functional capabilities in a single versatile design. Figure 1 shows the recommended signal connections and jumper options for supporting a microprocessor in a standard 168-pin PGA socket. Table 1 lists settings for JP1 and JP2. Table 2 lists the pinout differences for several commonly used microprocessors.

Table 1. Jumper Settings

Header	Processor	Jumper
JP1	Enhanced Am486DX2 AMD-X5-133/160	1-2
	Intel486DX4 Enhanced Am486DX4 AMD-X5-150	None
JP2	Standard Am486DX2	1-2
	Standard Am486DX4	None
	Enhanced Am486 AMD-X5	1-3

Figure 1. Multi-Type CPU Socket Connections

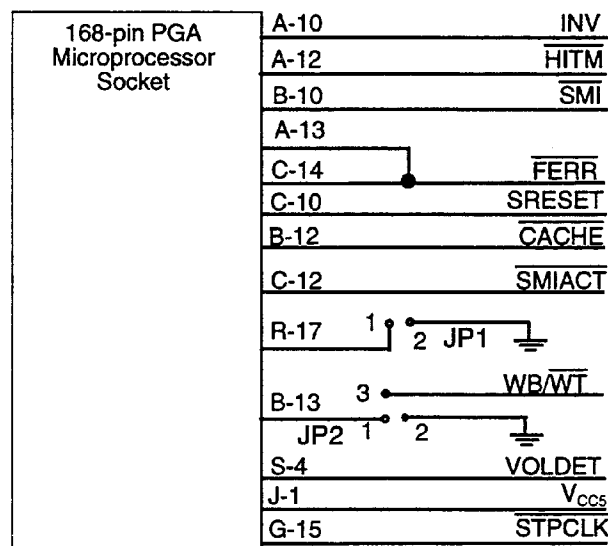


Table 2. Microprocessor Pinout Differences

Pin No.	AMD-X5 CPU	Enhanced Am486 CPU	Standard Am486 CPU (V _{CC} =3.3 V)	Am486DX2 CPU (V _{CC} =5 V)	169-Pin OverDrive Socket ¹	i486DX2 SL-Enhanced	i486DX4
A-10	INV	INV	INC	INC ²	INC	INC	INC
A-12	HITM	HITM	INC	INC ²	INC	INC	INC
A-13	INC	INC	INC	INC ²	FERR	INC	INC
B-10	SMI	SMI	INC	INC ²	SMI	SMI	SMI
B-12	CACHE	CACHE	INC	INC ²	INC	INC	INC
B-13	WB/WT	WB/WT	CLKMUL ³	INC ²	INC	INC	INC
B-14	TMS	TMS	TMS	TMS	UP	TMS	TMS
C-10	SRESET	SRESET	INC	INC ²	INC	SRESET	SRESET
C-12	SMI	SMI	INC	INC ²	SMI	SMI	SMI
C-14	FERR	FERR	FERR	FERR	INC	FERR	FERR
G-15	STPCLK	STPCLK	INC	INC	STPCLK	STPCLK	STPCLK
J-1	INC	INC	INC	V _{CC}	V _{CC} /V _{CC5}	V _{CC}	V _{CC5}
R-17	CLKMUL ⁴	CLKMUL ⁵	INC	INC	INC/CLKMUL	INC	CLKMUL
S-4	VOLDET	VOLDET	VOLDET	NC	NC/VOLDET	NC	VOLDET

Notes:

- When using the 237-pin version, refer to the next higher number and letter (i.e., A-13 = B-14).
- The INC indicates a design change from the NC pinout specifications in the published data sheets.
- Pin B-13 **MUST BE** connected to V_{SS} for proper operation of standard Am486DX2 microprocessor products.
- Pin R-17 **MUST BE** connected to V_{SS} for proper operation of AMD-X5-133 and AMD-X5-160 microprocessor products.
- Pin R-17 **MUST BE** connected to V_{SS} for proper operation of Enhanced Am486DX2 microprocessor products.