SGS-THOMSON MICROELECTRONICS

PC 486 Motherboard Configuration

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1. Overview

This document provides detailed information regarding the way to configure an existing PC motherboard in order to support the ST486DX2V or ST486DX4V. This implementation is intended to be a guideline to eliminate conflicts due to pinout differences only.

This specification is intended to support the following devices:

SGS-THOMSON ST486 DX2V
SGS-THOMSON ST486 DX4V

For additional information, please contact SGS-Thomson Microelectronics. Information in this document is subject to change without notification.

2. CPU Features

Each of the CPUs supported in this common socket specification is 486 bus compatible yet has a unique set of features that impacts the device pinout. Table 2-1 lists the features of the CPU .

Table 2-1. CPU Feature

CPU	VOLTAGE	WRITE-BACK	SMM & POWER MANAGEMENT	CORE CLOCK CONTROL	JTAG
ST486DX2V	3.45 V, 5 V IO	yes	yes	no	no
ST486DX4V	3.45 V, 5 V IO	yes	yes	2x, 3x	no

3. Board configuration

The 486 PC motherboards we can find on the open market offer various configurations for the CPU type, the Voltage supply, the cache configuration and the clock selection. This is possible by setting the right jumpers at the right value. For the ST486DX2V/DX4V the following items must be taken in account when you intend to install them on a motherboard:

- Voltage supply
- Clock selection
- Cache mode (WT or WB)
- System Management Mode (SMM)
- Power Management (PM)

First you must set up properly the supply voltage for the processor. Be careful, a wrong voltage can damage the processor and/or reduce its reliability.

3.1. Voltage supply

The ST486DX2V and ST486DX4V processors must be powered with:

VCC = 3.45V$\pm$0.15 (3.3V< VCC < 3.6V).

You must modify the board jumpers in order to comply with this requirement. If the board cannot support this configuration, please contact your board supplier in order to clarify that point with him. In any case the ST486DX2V or ST486DX4V should not be installed on a motherboard which doesn't allow the user to switch the CPU power supply to the correct value.

3.2. Clock selection

The ST486DX2V and ST486DX4V exist in different version depending on the internal core clock frequency they can support

- ST486DX2V66 (66MHz)
- ST486DX2V80 (80MHz)
  and
- ST486DX4V100 (100MHz)

For the ST486DX2V it is required that the motherboard be equipped with a jumper allowing the user to select the ratio between internal and external clocks. This jumper **must** be set in order to select x2 ratio. If the board cannot support this configuration, please contact your board supplier in order to clarify that point with him. For the ST486DX4V the clock ratio can be either x2 or x3.

The clock input (external clock) can be set to different values depending on jumper settings. The motherboards we can find on the open market generally allow the user to select the following values for the clock input:

    -25MHz
    -33MHz
    -40MHz
    -50MHz

For the ST486DX2-V66 the jumpers must be set in order to select 33MHz for the clock input. in the same way, for the ST486DX2V-80 the jumpers must be set in order to select 40MHz for the clock input.

For the ST486DX4V-100 there are two possibilities for the selection of the clock input. If the clock ratio selected is 3x, the jumper settings must be such as to select 33MHz. If the clock ratio selected is 2x, the jumper settings must be such as to select 50MHz.

If the board cannot support those configurations, please contact your board supplier in order to clarify that point with him.

3.3 Cache mode, System Management Mode and Power Management

Both the ST486DX2V/DX4V processors support the Write-Back internal cache, the System Management Mode and the Power Management. Those features have a unique ST handshake but are compatible with the pinout of the P24D. So, the general configuration of the board must be set in order to support the P24D.
After configuring the board as described, whenever you notice that your system doesn't perforrm as it should, you must change the jumper settings as follows:

    -Detect the jumper that is linked to Pin B12 on the processor with an Ohmmeter.
    -Configure this jumper as for a M7 processor and not a P24D.

Note:

i) If the board cannot support this configuration , select the configuration that suits for the i486DX2 processors with green functions. In that case the board will not use the internal write back cache mode.

ii) If the board cannot support this configuration, select the theconfiguration that suits for i486DX2 processors . In that case the board will not use the internal write back cache mode nor the SMM and PM.

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