

DP8473 Implementation into the PS/2 Floppy Controller Design

National Semiconductor
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The DP8473 floppy disk controller can be used in a PS/2 floppy controller design. While no external circuitry is required in a PC-AT application, the DP8473 requires some external circuitry to emulate additional registers added to the PS/2 floppy controller definition. There are some additional considerations when implementing the DP8473 into this application as well.

The IBM PS/2 floppy controller registers are different depending on which model you are using. That is, the Model 30 floppy controller registers have different definitions than the Model 50, 60, or 80. Thus, there are two PS/2 floppy controller register sets: the Model 30 and the Model 50/60/80.

Here is a brief summary of what external circuitry is required for a DP8473 implementation into a PS/2:

DIAGNOSTIC REGISTERS (Addresses 3F0 and 3F1 Read-Only)

The Model 30 definition is different than that of the Model 50/60/80 for these two diagnostic registers. These registers are not present on the DP8473 and must be implemented with external logic. See the PS/2 technical reference manuals for the full details.

DIGITAL OUTPUT REGISTER (Address 3F2 Write-Only)

The DP8473 has a compatible register at this address called the Drive Control Register. When doing a Model 50/60/80 design, the INT and DRQ output signals must have pull-down resistors on them. This is because the DP8473 has a bit defined in the Drive Control Register that will tri-state these signals, while this same bit is undefined in the Model 50/60/80. So to avoid these signals from being inadvertently set to TRI-STATE®, the pull-down resistors are necessary. This condition does not occur with the Model 30,

since its Digital Output Register is fully compatible with the DP8473 Drive Control Register.

CONFIGURATION CONTROL REGISTER (Address 3F7 Write-Only)

This register is similar to the Data Rate Register of the DP8473. The Model 50/60/80 Configuration Control Register is fully compatible with the DP8473 Data Rate Register. However, some additional bits have been defined in the Model 30. The bits that set the data rate are compatible with the DP8473, but there is an additional bit that enables Write Precompensation. However, since the DP8473 has no way of disabling write precomp anyway, there is no need for external circuitry in this case.

DIGITAL INPUT REGISTER (Address 3F7 Read-Only)

This register is defined differently for the Model 30 and the Model 50/60/80. The Model 50/60/80 DIR is compatible with the DP8473 Disk Changed Register, with the addition of one input. The Model 30 DIR differs greatly from the DP8473 Disk Changed Register, and should be emulated with external logic.

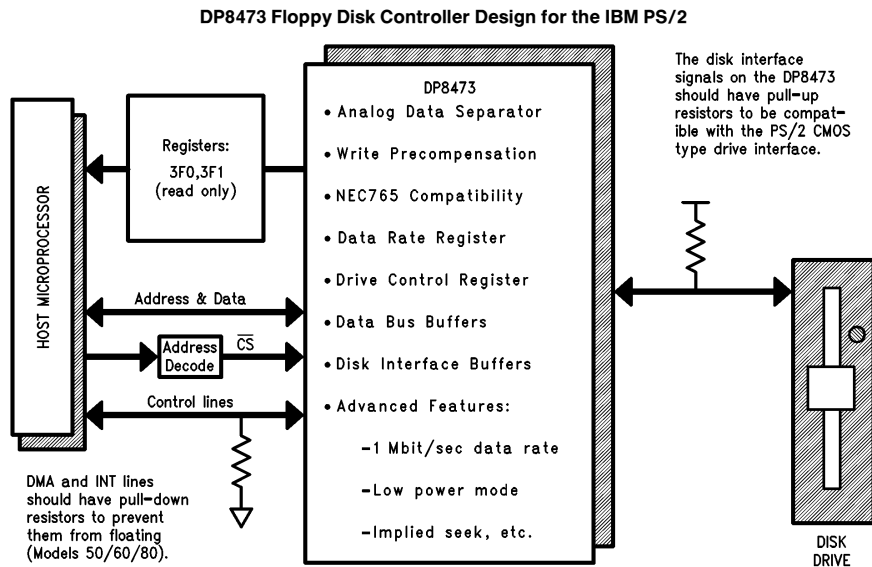
PS/2 CMOS DISK DRIVES

The PS/2 uses disk drives with CMOS compatible signals instead of the open-collector type signals used in the PC-AT and DP8473. To make the DP8473 open-collector type outputs compatible with these PS/2 disk drives, all disk interface output signals on the DP8473 should have 1 k Ω pull-up resistors, in addition to the pull-up resistors on the disk interface inputs.

SUMMARY

With additional logic, the DP8473 is a fully compatible floppy disk controller solution for PS/2 computers. Its internal analog data separator will increase the overall system performance and reduce the bit error rate of the system.

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