TMS320 DSP
DESIGNER'S NOTEBOOK

TMS320C40 Boot Loader Selection

APPLICATION BRIEF: SPRA208

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TEXAS INSTRUMENTS

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TMS320C40 Boot Loader Selection

Abstract

The TMS320C40 includes a boot loader to allow users to load and execute programs from a host processor, inexpensive ROM, or other standard memory devices. This document discusses how to select the boot loader and how to use it. A schematic is included.

Design Problem

How do I set up to use the boot loader from a system design point of view?

Solution

The TMS320C40 includes a boot loader to allow users to load and execute programs from a host processor, inexpensive ROM, or other standard memory devices.

The boot loader function is selected by 1) setting RESTLOC(1,0) = 00b and 2) driving the on-chip ROM enable pin (ROMEN) high when resetting the processor. After reset, the loader mode is determined by the status of the IIOF3-1 pins, which are configured as general-purpose inputs at reset. Although the IIOF0 pin is not used for boot load options, it is assumed to be high. The status of the IIOF3-0 pins is read by polling the IIOF flags in the CPU register, IIF. The options are listed in Figure 1.

Table 1. Boot Loader Options

IIOF3	IIOF2	IIOF1	IIOF0	Function
1	1	0	1	Memory Boot Loader from 0x00300000
1	0	1	1	Memory Boot Loader from 0x40000000
1	0	0	1	Memory Boot Loader from 0x60000000
0	1	1	1	Memory Boot Loader from 0x80000000
0	1	0	1	Memory Boot Loader from 0xA0000000
0	0	1	1	Memory Boot Loader from 0xC0000000
0	0	0	1	Reserved
1	1	1	1	Communication Port Boot Loader

Figure 1. Circuit for Generation of IIOF Signal for Boot Loader Selection
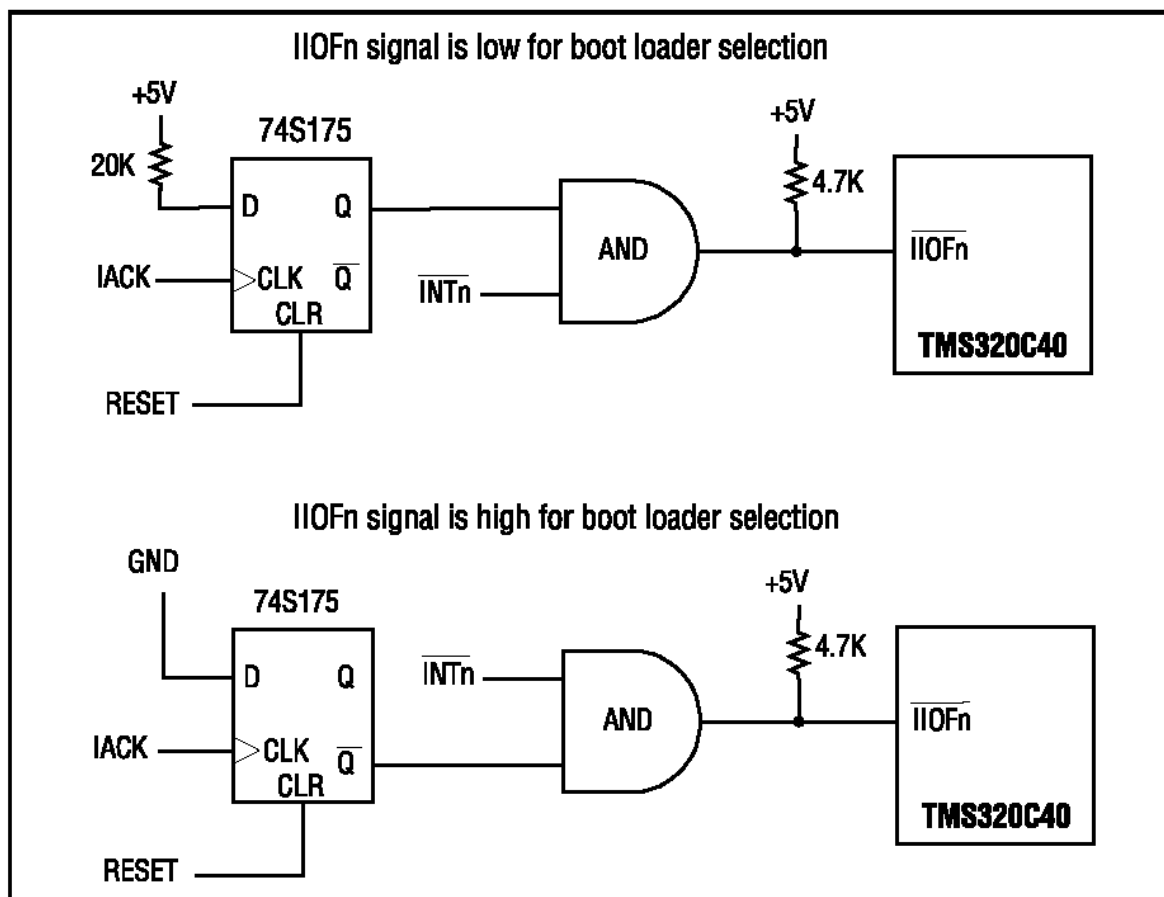
To select the correct boot loader mode, the IIOF3-0 pin must be a valid status value for a certain time period (refer to the TMS320C40 boot loader program in Section 13.2.7 of the TMS320C4x User's Guide for detailed information) and the ROMEN pin should be high at all times before host load is completed. Since the IACK signal will be brought down for one cycle after the boot load is completed (see note), it can be used as a termination signal for boot load. Figure 2 shows a sample circuit to generate the IIOF3-0 signals for boot load selection when the user wishes to use the IIOFn flag for boot load control and interrupt/general purpose I/O. If an IIOFn pin is used only for boot loader selection, pullups or tie downs can be used. In this example, after reset, the IIOF pins will stay low until the IACK signal is received.

NOTE:

The address for the IACK instruction should be pointed to external memory where the ready signal is applicable.