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April 1st, 2010
Renesas Electronics Corporation

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M32C/84, 85, 86, 87, 88 Group

DMA (DMA0 and DMA1 Only) Setup Procedure in C (NC308WA Ver. 5 or Later)

1. Abstract

The document describes how to set up DMA (DMA0 and DMA1 only) in C language and shows an application example.

2. Introduction

The application example described in this document is applied to the following MCUs and parameter(s):

MCUs: M32C/84 Group
 M32C/85 Group
 M32C/86 Group
 M32C/87 Group
 M32C/88 Group

M32C/90, 80, and M16C/80 Series
 C compiler version: M3T-NC308WA V.5.00 Release 1 or later

For C compiler versions earlier than M3T-NC308WA V.5.00 Release 1, refer to the M32C/84, 85, 86, 87, 88 Group Application Note **DMA Setup Procedure (When Using ASM Function)**. This program can be used with other M16C Family MCUs which have the same special function registers (SFRs) as the above MCUs. Check the manual for any additions and modifications to functions. Careful evaluation is recommended before using this application note.

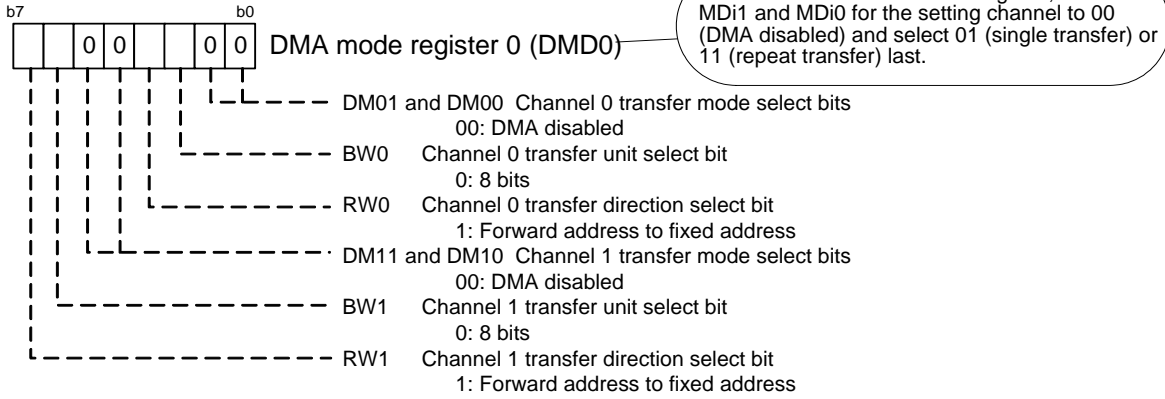
3. Application Example

In the M32C/84, 85, 86, 87, 88 Group, some of the DMAC-associated registers are allocated to the internal CPU registers. When using the C compiler (M3T-NC308WA V.5.00 Release 1 or later) for the M32C/90, 80, and M16C/80 Series, DMAC registers can be accessed allocating external variables to DMAC-only registers by using “#pragma DMAC”.

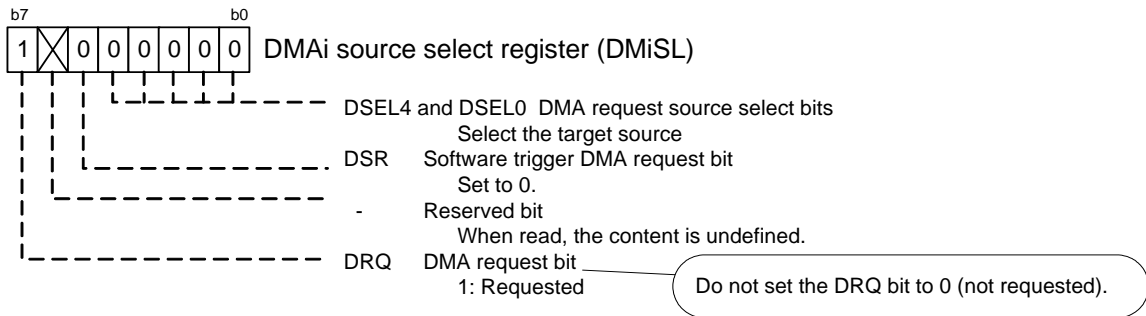
3.1 Setup

This section shows how to set up DMA as the following sequence in **3. Application Example**. Refer to the MCUs Hardware Manual for details of individual registers.

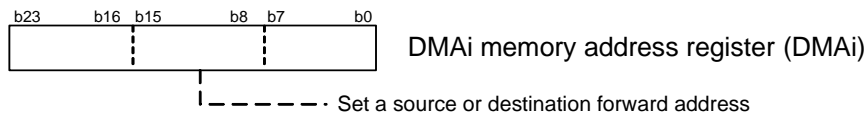
(1) Set the DMA mode register



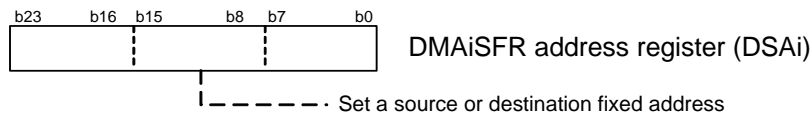
(2) Set the DMAi source select register



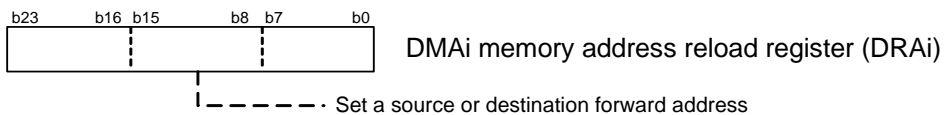
(3) Set the DMAi memory address register



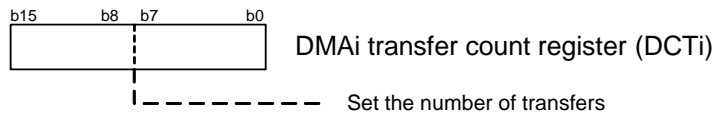
(4) Set the DMAiSFR address register



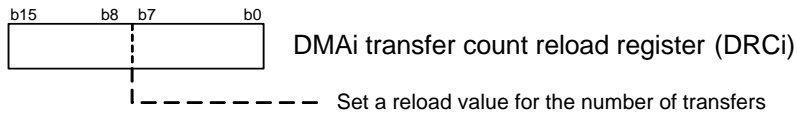
(5) Set the DMAi memory address reload register



(6) Set the DMAi transfer count register



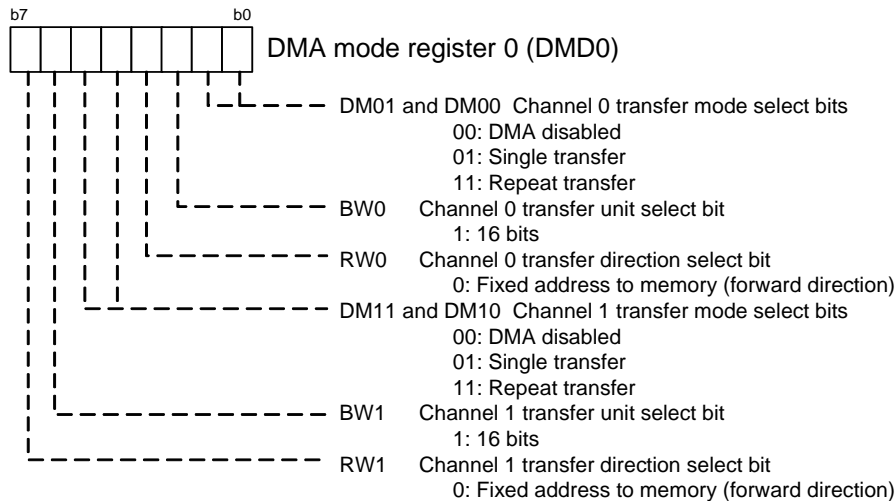
(7) Set the DMAi transfer count reload register



(8) Insert a dummy cycle.

Enable DMA after setting the DMiSL register (i = 0 to 3) and waiting six or more BCLK cycles by a program.

(9) Set the DMA mode register



4. Sample Programming Code

A sample program can be downloaded from the Renesas Technology website.
For download, click “Application Notes” in the left-hand side menu of the M16C Family page.

5. Reference Documents

Hardware Manuals

M32C/84 Group Hardware Manual

M32C/85 Group Hardware Manual

M32C/86 Group Hardware Manual

M32C/87 Group Hardware Manual

M32C/88 Group Hardware Manual

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REVISION HISTORY	M32C/84, 85, 86, 87, 88 Group DMA (DMA0 and DMA1 Only) Setup Procedure in C (NC308WA Ver. 5 or Later)
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Rev.	Date	Description	
		Page	Summary
1.00	Sep 10, 2006	-	First Edition issued

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