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Renesas Electronics Corporation

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H8SX Family

MOVSD Block Transfer Instruction

Introduction

Performs block transfer using the MOVSD block transfer instruction.

Contents

1. Specifications

- Transfer source data in ROM is transferred to RAM using the “movsd” function, a MOVSD block transfer instruction intrinsic function.
- Transfer source data comprises “H'1, H'2, H'3, H'4, H'5, H'6, H'7, H'8, H'0, H'A, ...”, the 9th byte having a value of 0.
- The movsd function stops processing when “0” is transferred, and outputs the remaining number of transfer bytes as a return value.
- The MOVSD instruction transfer unit is byte size (8 bits), and the number of transfers can be specified in the range 1 to 65,536.
- The maximum number of transfers is set to 16.

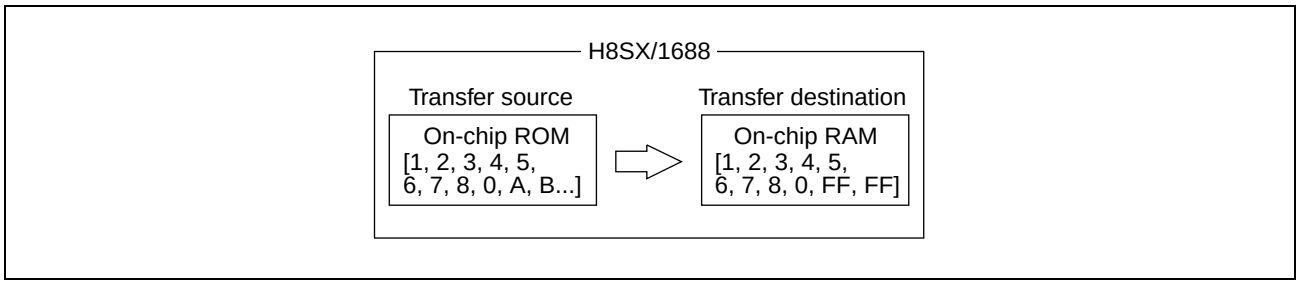


Figure 1 MOVSD Block Transfer Instruction

2. Functions Used

This sample task shows an example of use of the movsd function.

3. Principles of Operation

An overview of the operation of this sample task is shown below.

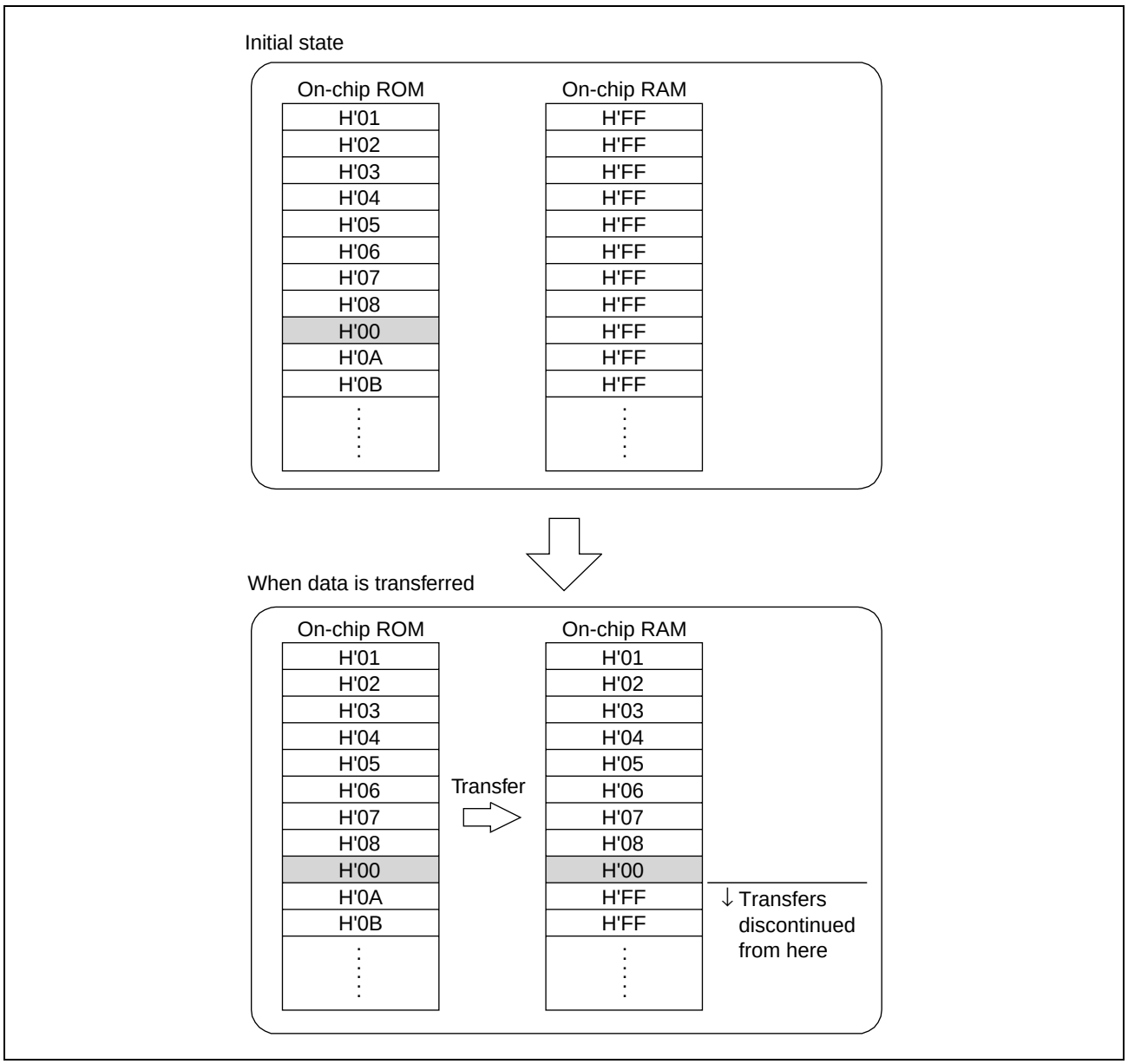


Figure 2 Example of MOVSD Block Transfer Instruction Operation

4. Development Environment

4.1 Development Support Tool Versions

The development environment support tools of this sample task is shown in table 1.

Table 1 Development Support Tool Versions

Software Name	Version Used
CH38.EXE	C compiler (H8S, H8/300 series C/C++ compiler) Ver. 6.0.00.005
ASM38.EXE	Assembler (H8S, H8/300 series cross assembler) Ver. 6.0.01.005
OPTLNK.EXE	Linkage editor (optimizing linkage editor) Ver. 8.0.00.020
LBG38.EXE	Library configuration tool (H8S, H8/300 series C/C++ standard library generator) Ver. 2.0.00.000

4.2 C compiler Option Settings

C compiler option settings for this sample task are shown in table 2.

Table 2 C compiler Option Settings

Option	Set Value
CPu	H8SXA:24:MD
Code	Machinecode
OPtimize	1
REGParam	3
SPeed	Register, SHift, STruct, Expression

5. Description of Software

5.1 Modules

Modules used by this sample task are shown in table 3.

Table 3 Modules

Module Name	Function
main	Main routine Calls movsdtst function.
movsdtst	movsd test program Performs block transfer using movsd function.

5.2 Arguments

No arguments are used by this sample task.

5.3 Internal Registers Used

No internal registers are used by this sample task.

5.4 RAM Usage

Table 4 describes RAM usage in this sample task.

Table 4 RAM Usage

Label	Size	Function
dst_ram[16]	16 × 4 bytes	Transfer destination area

5.5 Constants Used

Constants used by this sample task are shown in table 5.

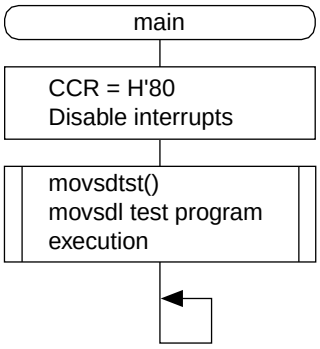
Table 5 Constants Used

Label	Size	Function

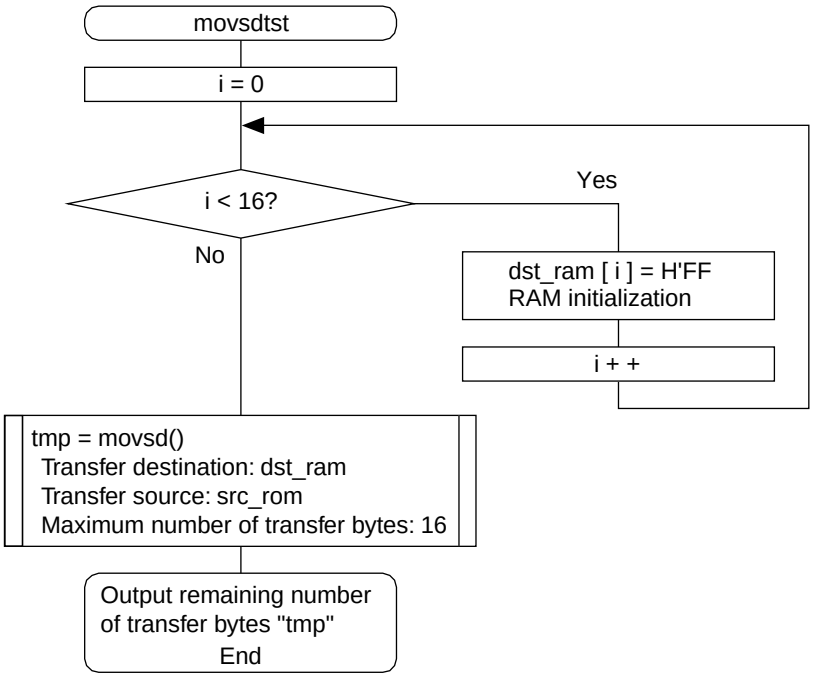
src_rom[16]	16 × 4 bytes	Transfer destination area
		char src_rom[16] ={
		0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07, 0x08,
		0x00, 0x0A, 0x0B, 0x0C, 0x0D, 0x0E, 0x0F, 0x10,
		}

6. Flowcharts

6.1 Main Routine



6.2 movsd Test Program



6.3 Link Address Specifications

Section Name	Address
CV1	H'000000
P,D	H'001000
B	H'FEC000

7. Program Listing

7.1 C Program

```
/************************************************************/
/*                                                          */
/*  H8SX Family                                             */
/*  Application Note                                        */
/*                                                          */
/*  'MOVSD'                                                 */
/*                                                          */
/*  Function                                                */
/*  : MOVSD                                                 */
/*                                                          */
/*                                                          */
/*                                                          */
/*                                                          */
/************************************************************/

#include    <machine.h>

/************************************************************/
/*  Function define                                         */
/************************************************************/
void main ( void );
unsigned int movsdtst ( void );

/************************************************************/
/*  RAM define                                              */
/************************************************************/
char dst_ram[16];

/************************************************************/
/*  ROM define                                              */
/************************************************************/
char src_rom[16] = {
    0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07, 0x08,
    0x00, 0x0A, 0x0B, 0x0C, 0x0D, 0x0E, 0x0F, 0x10,
};

/************************************************************/
/*  Vector Address                                          */
/************************************************************/
#pragma section     V1                      /* VECTOR SECTOIN SET               */
void (*const VEC_TBL1[])(void) = {
    main                                    /* 00 Reset                         */
};

#pragma entry main(sp=0xFFC000)
#pragma section                             /* P                                */
/************************************************************/
/*  Main Program                                            */
/************************************************************/
```

```
void main ( void )
{
    set_ccr(0x80);                          /* Initialize CCR/Interrupt Disable */

    movsdtst();

    while(1);
}

/*********************************************************/
/*  MOVSD function Test Program                          */
/*********************************************************/
unsigned int movsdtst ( void )
{
    unsigned int tmp;
    unsigned char i;

    for ( i=0; i<16; i++)                   /* Ram area memory fill "0xFF"      */
        dst_ram[i] = 0xFF;

    tmp = movsd ( dst_ram, src_rom, 16 );   /* Copy src_rom --> dst_ram         */

    return(tmp);
}
```

7.2 Assembly Language Code Generated by the C compiler

```
P                                                       ; section
                            ;*** File main.c      , Line 254
  00000000                  _main:                      ; function: main
  00000000 7A070FFFC000         MOV.L       #268419072,SP
  00000006 F880                 MOV.B       #128:8,R0L
  00000008 0308                 LDC.B       R0L,CCR
  0000000A 5500                 BSR         _movsdtst:8
  0000000C                  L41:
  0000000C 4000                 BRA         L41:8
  0000000E                  _movsdtst:                  ; function: movsdtst
  0000000E 01206DF4             STM.L       (ER4-ER6),@-SP
  00000012 1888                 SUB.B       R0L,R0L
  00000014                  L44:
  00000014 017DD8FF00000000     MOV.B       #-1:8,@(_dst_ram:32,R0L.B)
  0000001C 0A08                 INC.B       R0L
  0000001E A810                 CMP.B       #16:8,R0L
  00000020 4500                 BLO         L44:8
  00000022 7A0600000000         MOV.L       #_dst_ram,ER6
  00000028 7A0500000000         MOV.L       #_src_rom,ER5
  0000002E 79040010             MOV.W       #16:16,R4
  00000032 7B840000             MOVSD.B     ($+4)
  00000036 0FD0                 MOV.L       ER5,ER0
  00000038 0D40                 MOV.W       R4,R0
  0000003A 5426                 RTS/L       (ER4-ER6)
D                                                       ; section
  00000000                  _src_rom:                   ; static: src_rom
  00000000 0102030405060708     .DATA.B     H'01,H'02,H'03,H'04,H'05,H'06,H'07,H'08,
H'00,H'0A,H'0B,H'0C,H'0D,H'0E,H'0F,H'10
           000A0B0C0D0E0F10
B                                                       ; section
  00000000                  _dst_ram:                   ; static: dst_ram
  00000000 00000010             .RES.B      16
CV1                                                     ; section
  00000000                  _VEC_TBL1:                  ; static: VEC_TBL1
  00000000 00000000             .DATA.L     _main
```

Revision Record

		Description	
Rev.	**Date**	**Page**	**Summary**
1.00	Sep.15.04	—	First edition issued

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