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Renesas Electronics Corporation

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H8SX Family

MOVMD.L Block Transfer Instruction

Introduction

Performs block transfer using the MOVMD.L block transfer instruction.

Contents

1. Specifications

- Transfer source data in ROM is transferred to RAM using the “movmdl” function, a MOVMD.L block transfer instruction intrinsic function.
- The MOVMD.L instruction transfer unit is longword size (32 bits = 4 bytes), and the number of transfers can be specified in the range 1 to 65,536.
- The number of transfers is set to 16, and a total of 16 × 4 = 64 bytes are transferred.

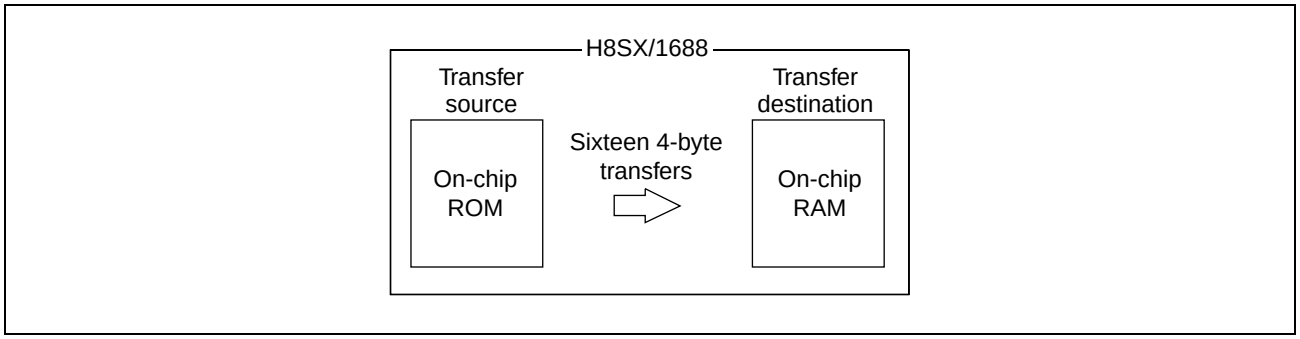


Figure 1 MOVMD.L Block Transfer Instruction

2. Functions Used

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

3. Principles of Operation

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

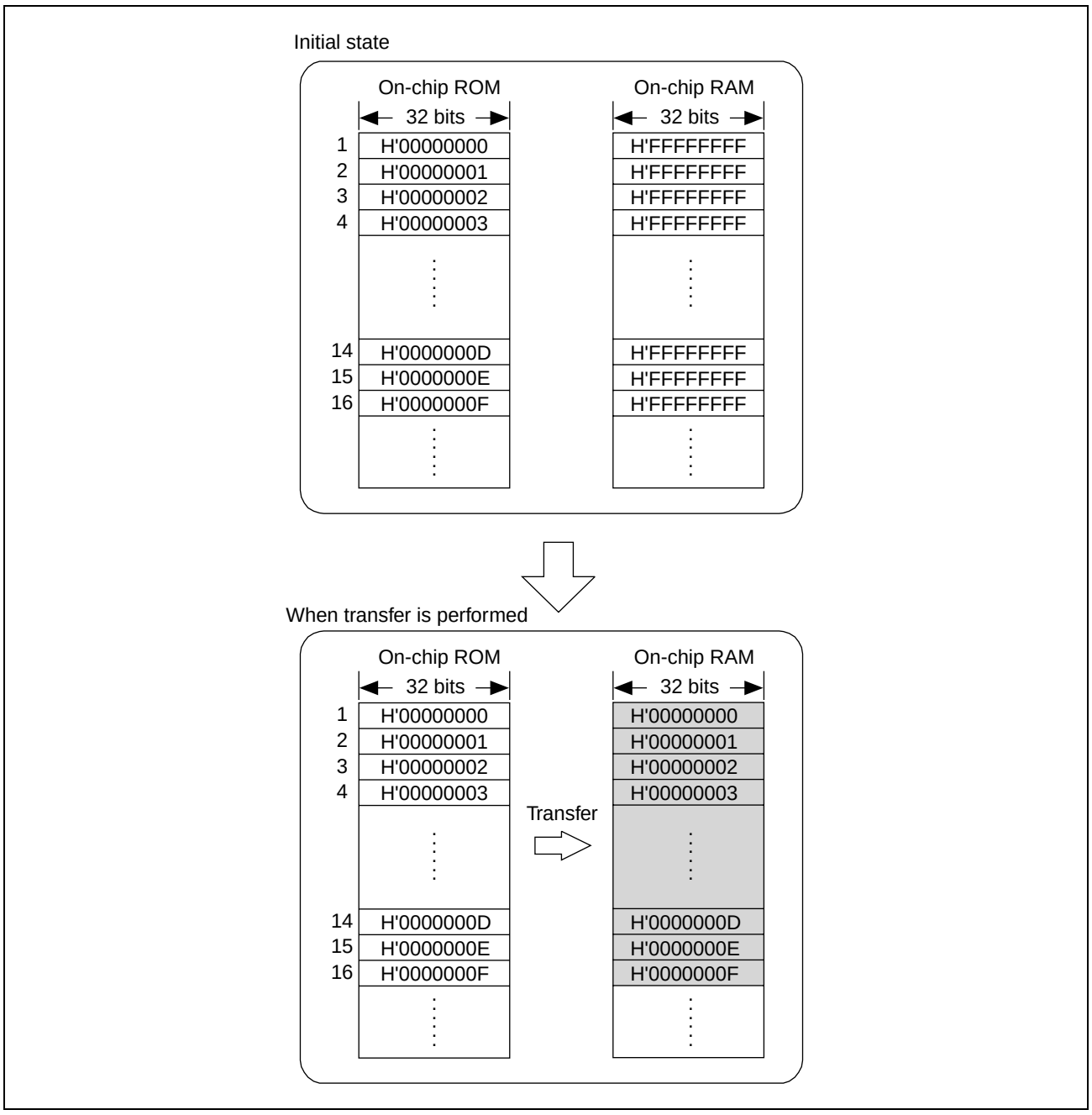


Figure 2 Example of MOVMD.L Block Transfer Instruction Operation

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 movmdltst function.
movmdltst	movmdl test program Performs block transfer using movmdl 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.

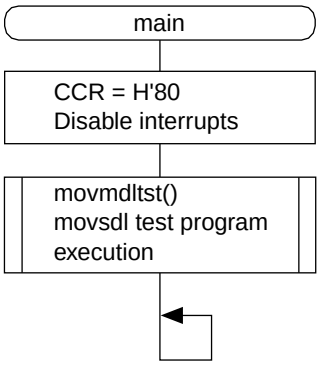
Table 5 Constants Used

Label	Size	Function

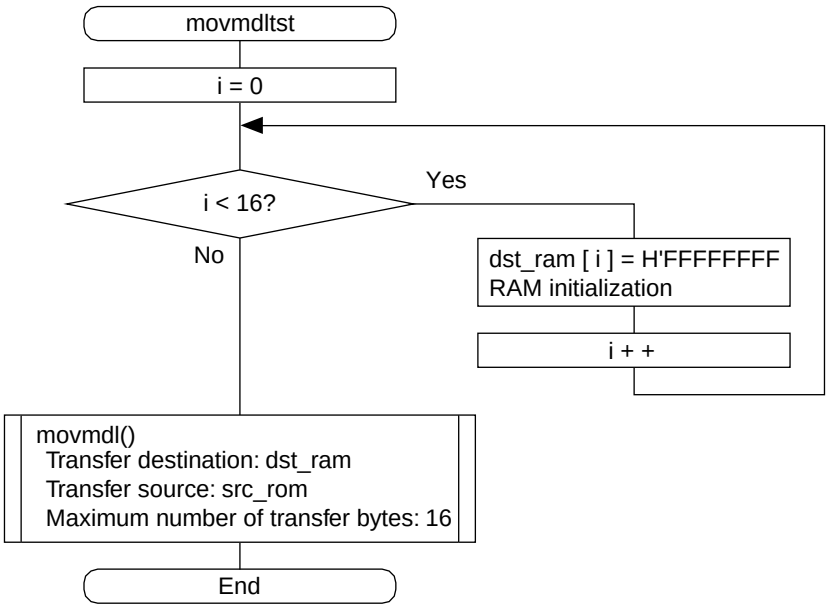
src_rom[16]	16 × 4 bytes	Transfer destination area
		long src_rom[16] ={
		0x00, 0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07,
		0x08, 0x09, 0x0A, 0x0B, 0x0C, 0x0D, 0x0E, 0x0F,
		}

6. Flowcharts

6.1 Main Routine



6.2 movmdl 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                                        */
/*                                                          */
/*  'MOVMD.L'                                               */
/*                                                          */
/*  Function                                                */
/*  : MOVMD.L                                               */
/*                                                          */
/*                                                          */
/*                                                          */
/*                                                          */
/************************************************************/

#include    <machine.h>

/************************************************************/
/*  Function define                                         */
/************************************************************/
void main ( void );
void movmdltst ( void );

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

/************************************************************/
/*  ROM define                                              */
/************************************************************/
long src_rom[16] = {
    0x00, 0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07,
    0x08, 0x09, 0x0A, 0x0B, 0x0C, 0x0D, 0x0E, 0x0F,
};

/************************************************************/
/*  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 */

    movmdltst();

    while(1);
}

/*********************************************************/
/*  MOVMD function Test Program                          */
/*********************************************************/
void movmdltst ( void )
{
    unsigned char i;

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

    movmdl ( dst_ram, src_rom, 16 );    /* Copy src_rom --> dst_ram         */
}
```

7.2 Assembly Language Code Generated by the C compiler

```
P                                                                ; section
                            ;*** File main.c      , Line 178
  00000000                  _main:                               ; function: main
  00000000 7A0700FFC000         MOV.L       #16760832,SP
  00000006 F880                 MOV.B       #128:8,R0L
  00000008 0308                 LDC.B       R0L,CCR
  0000000A 5500                 BSR         _movmdltst:8
  0000000C                  L40:
  0000000C 4000                  BRA        L40:8
  0000000E                  _movmdltst:                          ; function: movmdltst
  0000000E 01206DF4             STM.L       (ER4-ER6),@-SP
  00000012 1888                 SUB.B       R0L,R0L
  00000014                  L43:
  00000014 7A74FFFFFFFFD800     MOV.L       #-1:32,@(_dst_ram:32,R0L.B)
           00000000
  00000020 0A08                 INC.B       R0L
  00000022 A810                 CMP.B       #16:8,R0L
  00000024 4500                 BLO         L43:8
  00000026 7A0600000000         MOV.L       #_dst_ram,ER6
  0000002C 7A0500000000         MOV.L       #_src_rom,ER5
  00000032 79040010             MOV.W       #16:16,R4
  00000036 7BB4                 MOVMD.L
  00000038 5426                 RTS/L       (ER4-ER6)
D                                                                ; section
  00000000                  _src_rom:                            ; static: src_rom
  00000000 0000000000000001     .DATA.L     H'00000000,H'00000001,H'00000002,
H'00000003,H'00000004,H'00000005,H'00000006,H'00000007,H'00000008,H'00000009,
H'0000000A,H'0000000B,H'0000000C,H'0000000D,H'0000000E,H'0000000F
           0000000200000003
           0000000400000005
           0000000600000007
           0000000800000009
           0000000A0000000B
           0000000C0000000D
           0000000E0000000F
B                                                                ; section
  00000000                  _dst_ram:                            ; static: dst_ram
  00000000 00000040             .RES.L      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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