

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics Corporation

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## R8C/Tiny Series

### General-purpose Program for Converting from 4-byte HEX Code to BCD Code

#### 1. Abstract

This program converts 4-byte HEX code into 5-byte BCD code.

#### 2. Introduction

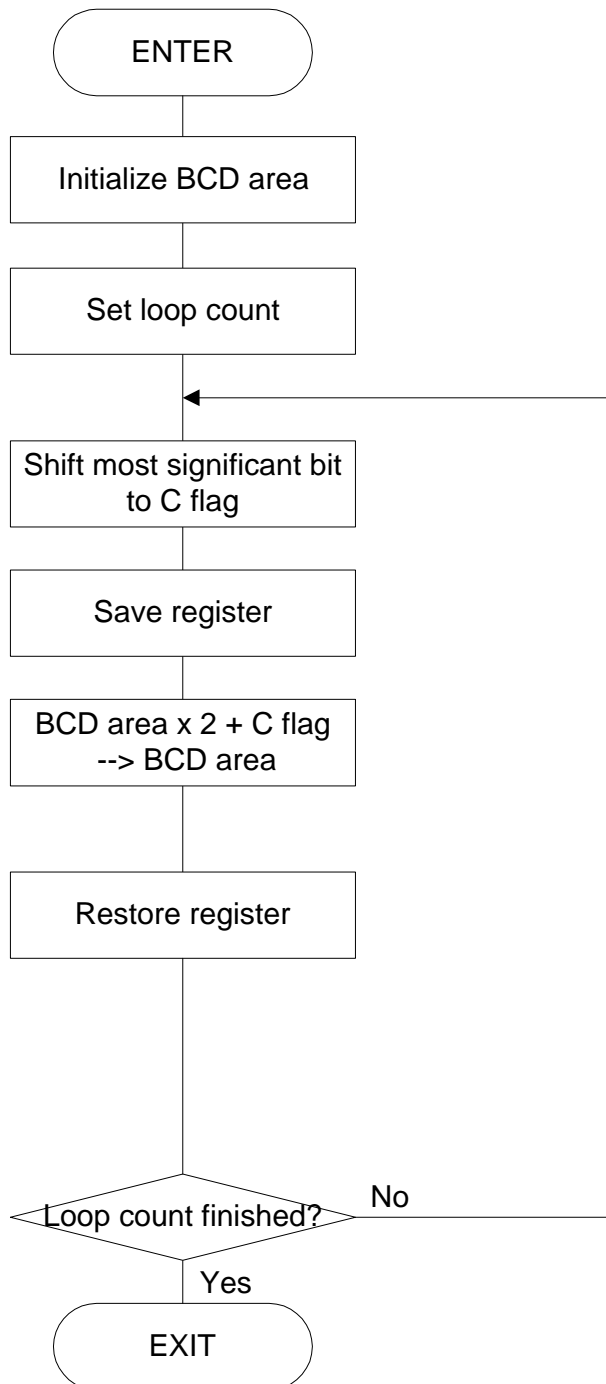
This program converts 4-byte HEX code into 5-byte BCD code. Set the HEX code in R3 and R1 beginning with the upper half. The BCD code is output to A1, R2, and R0 beginning with the most significant part.

In this program, the HEX code is doubled by decimal calculation sequentially beginning with the most significant bit and the results are added. This operation is repeated by a specified number of bits as the HEX code is converted into BCD code.

Subroutine name : HEXtoBCD_4byte	ROM capacity : 38 bytes
Interrupt during execution : Accepted	Number of stacks used : 2 bytes

Register/memory	Input	Output	Usage condition
R0	-	Lower part of BCD code	←
R1	Lower half of HEX code	Indeterminate	←
R2	-	Middle part of BCD code	←
R3	Upper half of HEX code	Indeterminate	←
A0	-	0000 <sub>16</sub>	Number of digits counter
A1	-	Upper part of BCD code	←
Usage precautions	The HEX code is destroyed as a result of program execution.		

### 3. Flowchart



#### 4. The example of a reference program

```

        .include apl.inc                ; special page include file
;*****
;
;
;   R8C Program Collection No. 19      *
;   CPU      : R8C/Tiny                *
;
;*****
VromTOP   .EQU    00D000H              ; 12Kbyte Flash version
;=====
;   Title: Converting from HEX code to BCD code
;   Outline: Converts 4-byte HEX code into 5-byte BCD code
;   Input:  -----> Output:
;   R0 ( )                R0 (Lower part of BCD)
;   R1 (Lower half of HEX code)    R1 (Indeterminate)
;   R2 ( )                R2 (Middle part of BCD)
;   R3 (Upper half of HEX code)    R3 (Indeterminate)
;   A0 ( )                A0 (Indeterminate)
;   A1 ( )                A1 (Upper part of BCD)
;   Stack amount used: 2bytes
;   Notes:
;=====
        .SECTION PROGRAM,CODE          ;
        .ORG    VromTOP                ; ROM area
HEXtoBCD_4byte:
        MOV.W #0,R0                    ; Initializes BCD area
        MOV.W #0,R2
        MOV.W #0,A1
        MOV.B #32,A0                    ; Sets loop count
HEXtoBCD_4byte_10:
        SHL.L #1,R3R1                  ; Shifts most significant bit to C flag
        PUSH.W R1                       ; Saves register
        MOV.W R0,R1
        DADC.W R1,R0                    ; Doubled by decimal calculation + C flag
        XCHG.W R2,R0
        MOV.W R0,R1
        DADC.W R1,R0                    ; Doubled by decimal calculation + carry
        XCHG.W R0,A1
        MOV.W R0,R1
        DADC.W R1,R0                    ; Doubled by decimal calculation + carry
        XCHG.W R0,A1
        XCHG.W R2,R0
        POP.W R1                         ; Restores register
        ADJNZ.W #-1,A0, HEXtoBCD_4byte_10 ; --> Executes next digit
        RTS
;
;
        .END
;

```

## 5. Reference

SOFTWARE MANUAL

R8C/Tiny Series SOFTWARE MANUAL

(Acquire the most current version from Renesas web-site)

## 6. Web-site and contact for support

Renesas Web-site

<http://www.renesas.com>

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Mail to : [support\\_apl@renesas.com](mailto:support_apl@renesas.com)

## REVISION HISTORY

Rev.	Date	Description	
		Page	Summary
1.00	Jul 08, 2002	-	First edition issued

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