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Renesas Electronics Corporation

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M16C/60 Series and M16C/20 Series

General-purpose Program for Converting from 1-byte HEX Code to BCD Code

1. Abstract

This program converts 1-byte HEX code into 2-byte BCD code.

2. Introduction

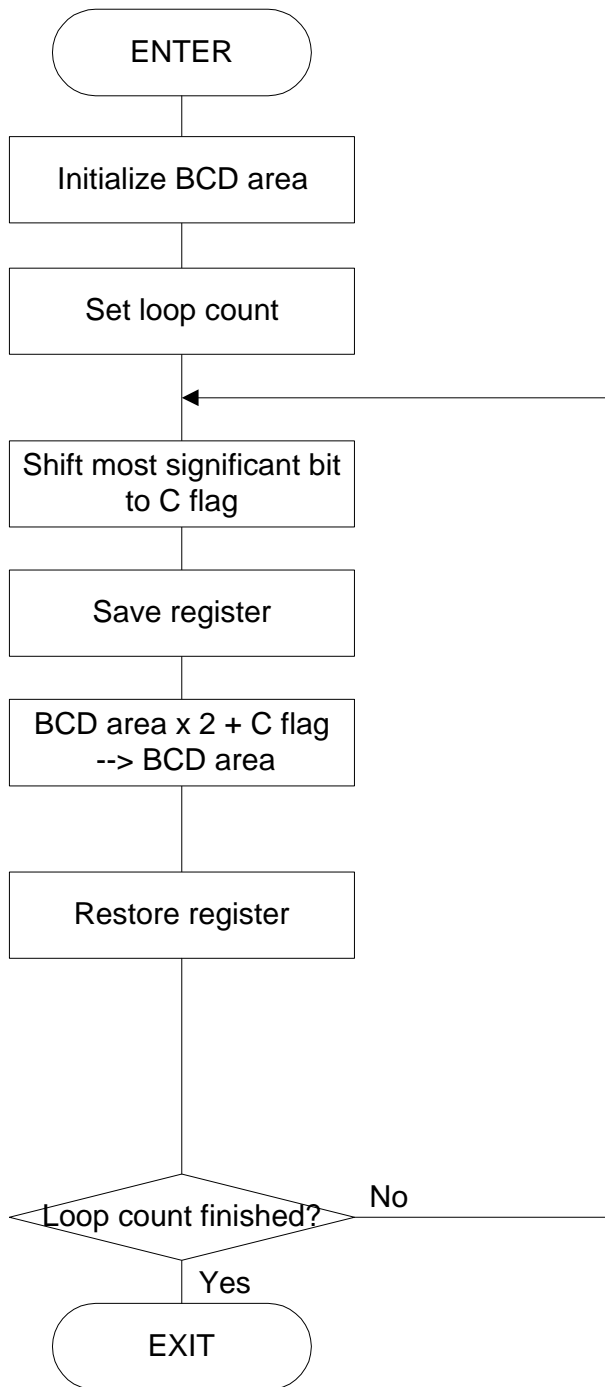
This program converts 1-byte HEX code into 2-byte BCD code. Set the HEX code in R1L. The BCD code is output to R0.

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_1byte	ROM capacity : 19 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0	-	BCD code	←
R1H	-	00 ₁₆	Loop count
R1L	HEX code	Indeterminate	←
R2	-	Indeterminate	Used to save data
R3	-	-	Unused
A0	-	-	Unused
A1	-	-	Unused
Usage precautions	HEX code is destroyed as a result of program execution.		

3. Flowchart



4. The example of a reference program

```

;*****
; *
; M16C General-purpose Programs *
; CPU : M16C *
; *
;*****
VromTOP      .EQU      0F0000H          ; Declares start address of ROM
;
;=====
; Title      : Converting from HEX code to BCD code
; Outline    : Converts 1-byte HEX code into 2-byte BCD code
; Input      : -----> Output:
; R0L ( )    R0      (BCD code)
; R0H ( )
; R1H (HEX code)  R1L  (Indeterminate)
; R1H ( )    R1H  (Indeterminate)
; R2 ( )    R2   (Indeterminate)
; R3 ( )    R3   (Unused)
; A0 ( )    A0   (Unused)
; A1 ( )    A1   (Unused)
; Stack amount used: None
; Notes:
;=====
                .SECTION      PROGRAM, CODE
                .ORG      VromTOP          ; ROM area
HEXtoBCD_1byte:
    MOV.W      #0, R0          ; Initializes BCD area
    MOV.B      #8, R1H        ; Sets loop count
HEXtoBCD_1byte_10:
    SHL.B      #1, R1L        ; Shifts most significant bit to C flag
    XCHG.W     R1, R2         ; Saves register
    MOV.W      R0, R1         ;
    DADC.W     R1, R0         ; Doubled by decimal calculation
                                ; + C flag
    XCHG.W     R1, R2         ; Restores register
    ADJNZ.B   #-1, R1H, HEXtoBCD_1byte_10 ; --> Executes next digit
    RTS
;
;
; .END
;

```

5. Reference

SOFTWARE MANUAL

M16C/60 M16C/20 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>

Contact for Renesas technical support

Mail to : support_apl@renesas.com

REVISION HISTORY

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

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