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Renesas Electronics Corporation

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M16C/60 Series and M16C/20 Series

General-purpose Program for Converting from Lowercase Alphabet to Uppercase Alphabet

1. Abstract

This program converts a lowercase English alphabet in ASCII code into an uppercase English alphabet in ASCII code.

2. Introduction

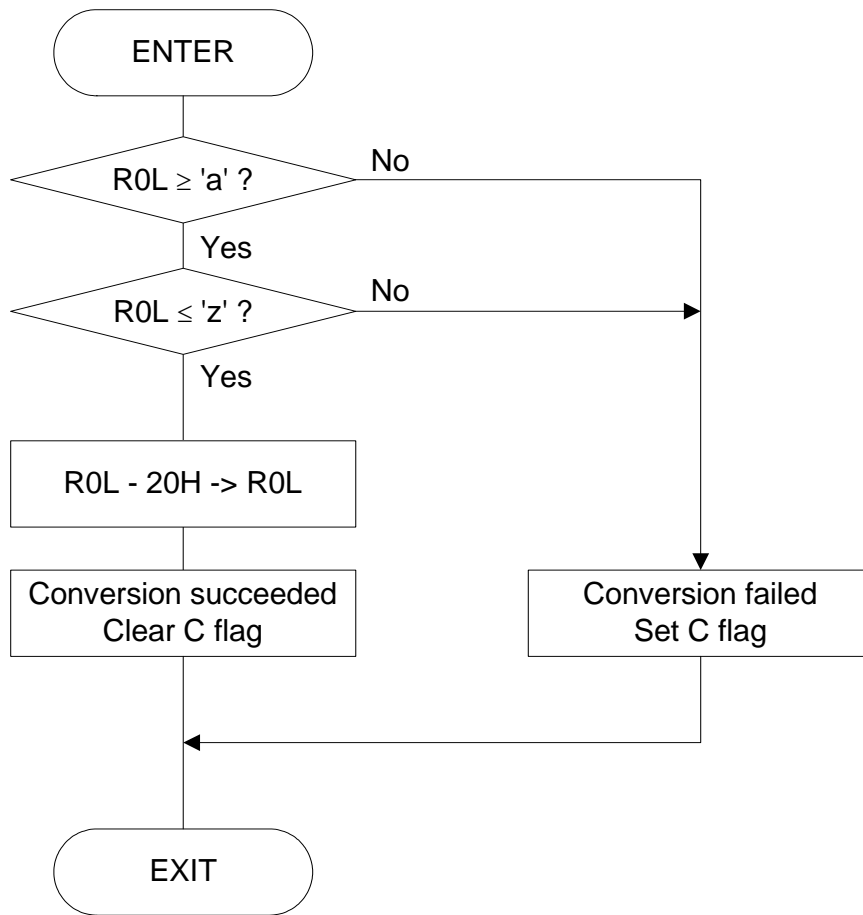
This program converts a lowercase English alphabet in ASCII code into an uppercase English alphabet in ASCII code. Set the lowercase English alphabet in ASCII code in R0L. The converted uppercase English alphabet in ASCII code is output to R0L. Conversion information is output to the C flag.

C	Meaning
0	Lowercase alphabet converted into uppercase alphabet
1	No converted because inconvertible code was input

Subroutine name : TOUPPER	ROM capacity : 16 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0L	Lowercase alphabet (ASCII)	Uppercase alphabet (ASCII)	←
R0H	-	-	Unused
R1	-	-	Unused
R2	-	-	Unused
R3	-	-	Unused
A0	-	-	Unused
A1	-	-	Unused
C flag	-	Conversion information	←
Usage precautions			

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 ASCII code lowercase alphabet into uppercase alphabet
; Contents of processing:
;             The ASCII code input in R0L is converted from a lowercase English alphabet
;             into an uppercase English alphabet and the result is returned to R0L.
;             No conversion is performed if any code is input in R0L that is not a
;             lowercase English alphabet.
; Procedure: (1) Input ASCII code in R0L.
;            (2) Call the subroutine.
;            (3) Converted ASCII code is loaded into R0L.
; Result: The C flag is cleared to 0 when the code was converted from a lowercase
;         alphabet into an uppercase alphabet. The C flag is set to 1 when the code
;         was not converted.
; Input      : -----> Output:
; R0L (ASCII code)      R0L   (ASCII code)
; R0H ( )              R0H   (Unused)
; R1 ( )              R1    (Unused)
; R2 ( )              R2    (Unused)
; R3 ( )              R3    (Unused)
; A0 ( )              A0    (Unused)
; A1 ( )              A1    (Unused)
; Stack amount used: None
;=====
                .SECTION    PROGRAM, CODE
                .ORG      VromTOP          ; ROM area
TOUPPER:
                ;
                CMP.B     #'a',R0L        ; Lowercase alphabet 'a' or above?
                JLTU     TOUPNON          ; --> no (not converted)
                CMP.B     #'z',R0L        ; Lowercase alphabet 'z' or below?
                JGTU     TOUPNON          ; --> no (not converted)
                SUB.B     #20H,R0L        ; Converts from lowercase alphabet into
                ; uppercase alphabet
                FCLR     C                ; Sets "converted" information
                RTS
TOUPNON:
                ;
                FSET     C                ; Sets "not-converted" information
                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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