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April 1st, 2010
Renesas Electronics Corporation

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M16C/60 Series and M16C/20 Series

General-purpose Program for Sorting

1. Abstract

This program sorts data consisting of a specified number of bytes (sizes in bytes) in ascending order.

2. Introduction

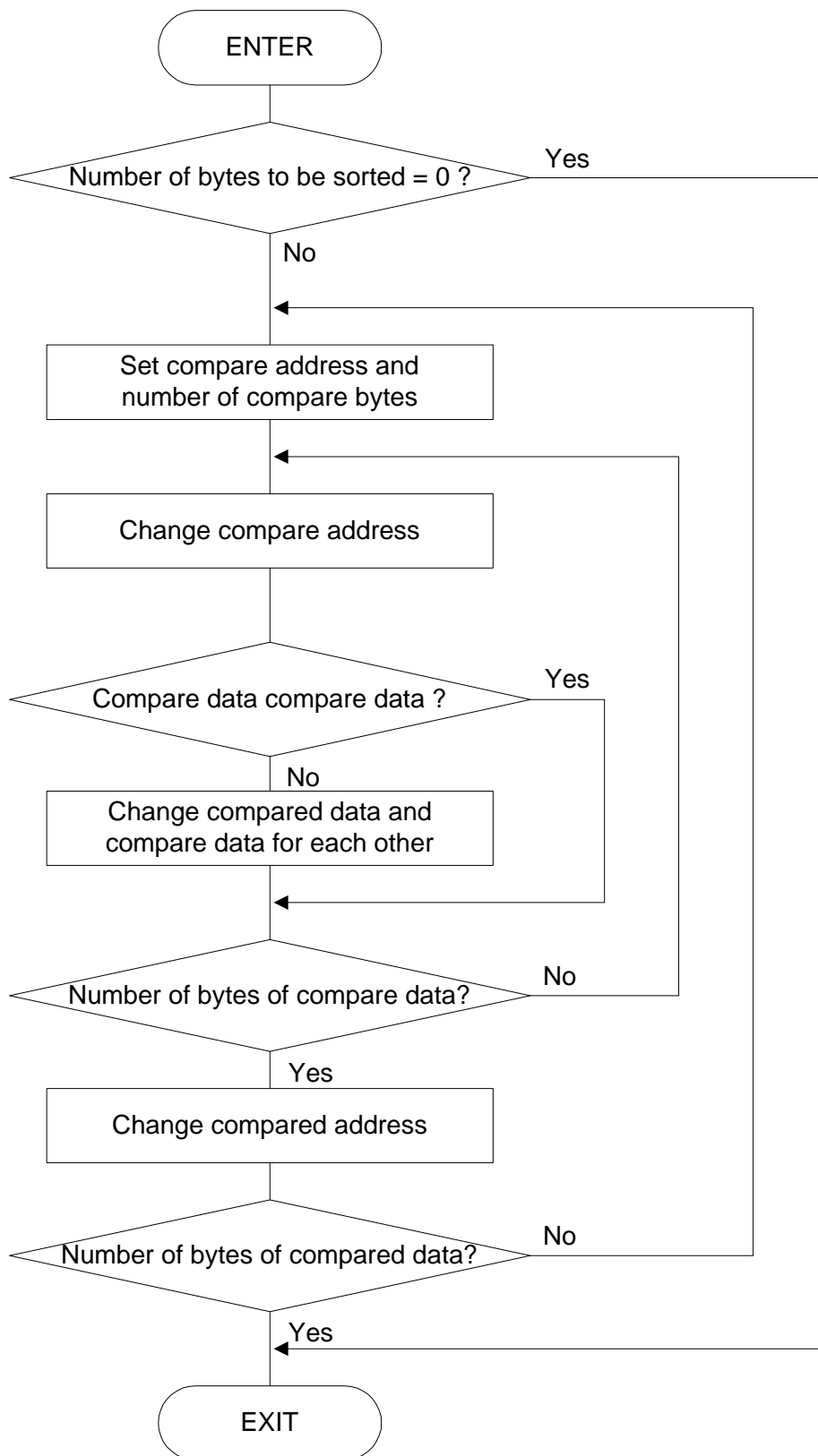
This program sorts data consisting of a specified number of bytes (sizes in bytes) in ascending order beginning with a specified address. Set the "number of bytes to be compared - 1" in R0L and the start address of the data in A0.

Z	Meaning
0	Sorting succeeded
1	Sorting failed

Subroutine name : SORT	ROM capacity : 28 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0L	Number of compare bytes - 1	Indeterminate	Compare bytes counter
R0H	-	Indeterminate	Compare bytes counter
R1L	-	Indeterminate	Register used for change
R1H	-	-	Unused
R2	-	-	Unused
R3	-	-	Unused
A0	Start address	Indeterminate	Compared address
A1	-	Indeterminate	Compare address
Z flag	-	Sorting succeeded/failed	←
Usage precautions	The number of bytes that can be specified is 2 to 256 bytes.		

3. Flowchart



4. The example of a reference program

```

;*****
; *
; M16C General-purpose Programs *
; CPU : M16C *
; *
;*****
VromTOP    .EQU    0F0000H           ; Declares start address of ROM
;
;=====
; Title    : Sorting
; Outline  : Sorts given data (2 to 256 bytes) in ascending order
; Input    : -----> Output:
; R0L (Compare bytes - 1)          R0L (Indeterminate)
; R0H ( )                          R0H (Indeterminate)
; R1L ( )                          R1L (Indeterminate)
; R1H ( )                          R1H (Unused)
; R2 ( )                          R2 (Unused)
; R3 ( )                          R3 (Unused)
; A0 (Start address)              A0 (Indeterminate)
; A1 ( )                          A1 (Indeterminate)
; Stack amount used: None
; Notes   : Success or failure of sorting is returned by Z flag
;=====
                .SECTION    PROGRAM, CODE
                .ORG      VromTOP           ; ROM area
SORT:
                ;
                CMP.B     #0, R0L          ;
                JEQ      SORT_EXIT        ; --> Number of compare bytes not set
SORT_10:
                ;
                MOV.B     R0L, R0H        ; Sets number of compare bytes
                MOV.W     A0, A1         ; Sets compare address
SORT_20:
                ;
                INC.W     A1              ; Changes compare address
                CMP.B     [A0], [A1]     ; Compare data to see if large or small
                JGEU     SORT_30        ; --> Sorting unnecessary
                MOV.B     [A0], R1L      ; Changes compared and compare data for
                ;                      ; each other
                XCHG.B    R1L, [A1]     ;
                MOV.B     R1L, [A0]     ;
SORT_30:
                ;
                ADJNZ.B   #-1, R0H, SORT_20 ; --> Looped for compare data
                INC.W     A0             ; Changes compared address
                ADJNZ.B   #-1, R0L, SORT_10 ; --> Looped for compared data
                FCLR      Z              ; Sorting completed
SORT_EXIT:
                ;
                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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