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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

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R8C/Tiny 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

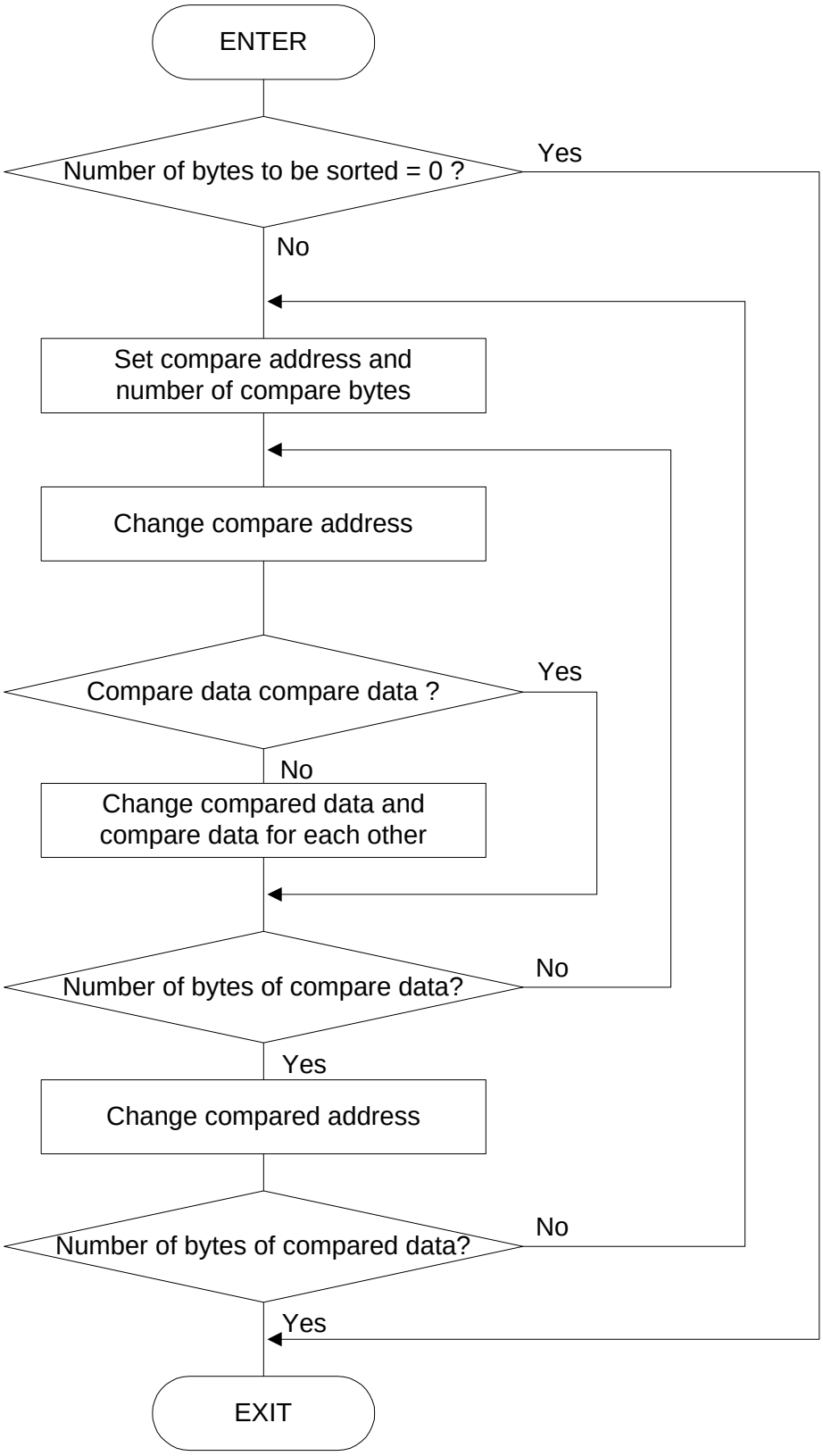
This program sorts data consisting of a specified number of bytes (sizes in bytes) in ascending order beginning with a specified address. Set the “number of bytes to be compared - 1” in R0L and the start address of the data in A0.

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


ENTER
Number of bytes to be sorted = 0 ?
Yes
No
Set compare address and number of compare bytes
Change compare address
Compare data compare data ?
Yes
No
Change compared data and compare data for each other
Number of bytes of compare data?
No
Yes
Change compared address
Number of bytes of compared data?
No
Yes
EXIT

4. The example of a reference program

```
                .include apl.inc                        ; special page include file
;***************************************************************************************
;                                                                                      *
;     R8C Program Collection No. 24                                                   *
;     CPU           : R8C/Tiny                                                         *
;                                                                                      *
;***************************************************************************************
VromTOP         .EQU        00D000H                     ; 12Kbyte Flash version
;                                                       ;
;=======================================================================================
;     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
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

Contact for Renesas technical support

Mail to : support_apl@renesas.com

REVISION HISTORY

Rev.	Date	Description	
		Page	Summary
1.00	Dec 24, 2003	-	First edition issued

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