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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 Comparing 32 Bits

1. Abstract

This program compares 32-bit data between registers.

This program compares 32-bit data between memory locations.

2. Introduction

This program compares 32-bit data between registers. Set the comparing data in R2 and R0 and the compared data in R3 and R1 beginning with the upper half, respectively. The comparison result is output to the Z and C flags. This program compares 32-bit data between memory locations. Set the least significant memory address of the comparing data and that of the compared data in the address registers. The comparison result is output to the Z and C flags.

C	Z	Meaning
1	0	Comparing data < compared data
1	1	Comparing data = compared data
0	0	Comparing data > compared data

(1) 32-bit comparison (register)

Subroutine name : COMP32	ROM capacity : 7 bytes
Interrupt during execution : Accepted	Number of stacks used : None

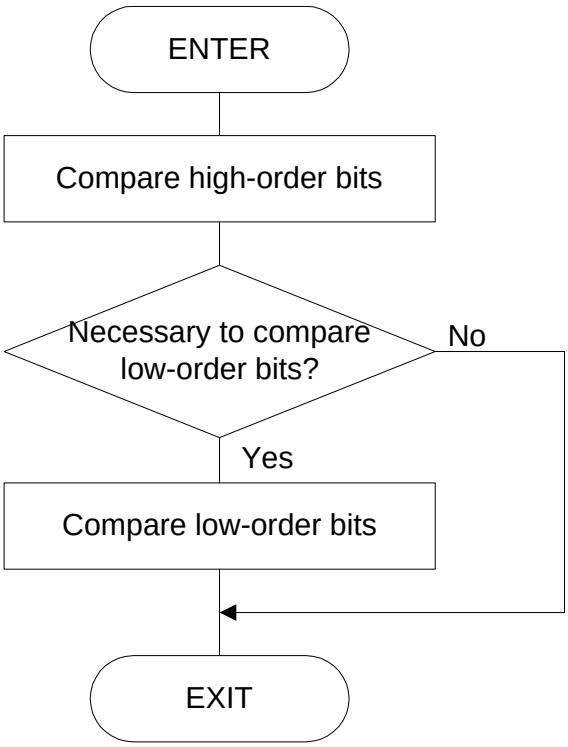
Register/memory	Input	Output	Usage condition
R0	Lower half of comparing data	Does not change	←
R1	Lower half of compared data	Does not change	←
R2	Upper half of comparing data	Does not change	←
R3	Upper half of compared data	Does not change	←
A0	-	-	Unused
A1	-	-	Unused
Z/C flag	-	Compared data	←
Usage precautions			

(2) 32-bit comparison (memory)

Subroutine name : COMPmemory32	ROM capacity : 9 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0	-	-	Unused
R1	-	-	Unused
R2	-	-	Unused
R3	-	-	Unused
A0	Address of comparing data	Does not change	←
A1	Address of compared data	Does not change	←
Memory indicated by A0	Comparing	Does not change	←
Memory indicated by A1	Compared	Does not change	←
Z/C flag	-	Comparison result	←
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     : Comparing 32 bits
; Outline   : Compares 32-bit data between registers.
; Input     : ------------------------------> Output:
; R0 (Lower half of comparing data)     R0 (Does not change)
; R1 (Lower half of compared data)      R1 (Does not change)
; R2 (Upper half of comparing data)     R2 (Does not change)
; R3 (Upper half of compared data)      R3 (Does not change)
; A0 ( )                           A0 (Unused)
; A1 ( )                           A1 (Unused)
; Stack amount used: None
; Notes     : Result is returned by Z and C flags.
;=============================================================
            .SECTION    PROGRAM,CODE
            .ORG     VromTOP             ; ROM area
COMP32:                                  ;
   CMP.W       R2,R3                     ; Compares high-order bits
   JNE      COMP32exit                   ; --> Result is output after comparing
                                         ; only high-order bits
   CMP.W       R0,R1                     ; Compares low-order bits
COMP32exit:                              ;
   RTS                                   ;
;                                        ;
;=============================================================
; Title     : Comparing 32 bits
; Outline   : Compares 32 bits between memory locations.
; Input     : ------------------------------> Output:
; R0 ( )                           R0 (Unused)
; R1 ( )                           R1 (Unused)
; R2 ( )                           R2 (Unused)
; R3 ( )                           R3 (Unused)
; A0 (Address of comparing data)       A0 (Does not change)
; A1 (Address of compared data)        A1 (Does not change)
; Stack amount used: None
; Notes     : Result is returned by Z and C flags.
;=============================================================
COMPmemory32:                            ;
   CMP.W       2[A0],2[A1]               ; Compares high-order bits
   JNE      COMPmemory32exit             ; --> Result is output after comparing
                                         ; only high-order bits
   CMP.W       [A0],[A1]                 ; Compares low-order bits
COMPmemory32exit:                        ;
   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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