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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 Calculating Sum-of-Products

1. Abstract

This program calculates a sum of products using a sum-of-products calculating instruction (RMPA).

2. Introduction

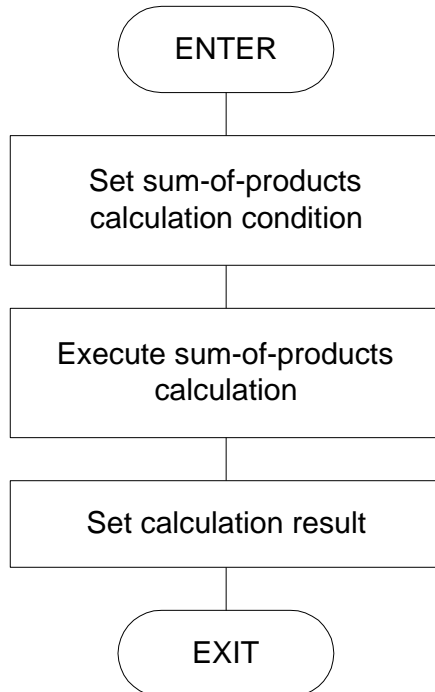
This program calculates a sum of products using a sum-of-products calculating instruction (RMPA). Set the multiplier in a variable area (DATA11-13) and the multiplicand in a variable area (DATA21-23). The result of sum-of-products calculation is output to a variable area (ANS).

The program sets the number of sum-of-products in R3, the multiplicand address in A0, and the multiplier address in A1 before executing the RMPA instruction.

Subroutine name : -	ROM capacity : 15 bytes
Interrupt during execution : Accepted	Number of stacks used : None

Register/memory	Input	Output	Usage condition
R0	-	Result of sum-of-products calculation	Used for calculation
R1	-	-	Unused
R2	-	-	Unused
R3	-	0000 ₁₆	Number of some-of-products
A0	-	Last address of multiplicand	Multiplicand address
A1	-	Last address of multiplier	Multiplier address
DATA11 to 13	Multiplicand	Does not change	←
DATA21 to 23	Multiplier	Does not change	←
ANS	-	Result of sum-of-products calculation	←
Usage precautions			

3. Flowchart



4. The example of a reference program

```

        .include apl.inc                ; special page include file
;*****
;
;
;   R8C Program Collection No. 6
;   CPU       : R8C/Tiny
;
;*****
VramTOP .EQU    000400H                ; USER PROGRAM RAM START ADDRESS
VromTOP .EQU    00D000H                ; 12Kbyte Flash version
Vsb     .EQU    000400H                ; Sets SB
;
;
;   .SECTION  RAM,DATA
;   .ORG     VramTOP                    ; RAM area
DATA11: .BLKB  1                        ; Multiplicand 1
DATA12: .BLKB  1                        ; Multiplicand 2
DATA13: .BLKB  1                        ; Multiplicand 3
DATA21: .BLKB  1                        ; Multiplier 1
DATA22: .BLKB  1                        ; Multiplier 2
DATA23: .BLKB  1                        ; Multiplier 3
ANS:    .BLKB  2                        ; Result of sum-of-products calculation
;=====
;   Title: Calculating sum-of-products
;   Outline: Calculates a sum of products.
;   Input:  -----> Output:
;   R0 ( )          R0 (Calculation result)
;   R1L ( )         R1L (Unused)
;   R1H ( )         R1H (Unused)
;   R2 ( )          R2 (Unused)
;   R3 ( )          R3 (Indeterminate)
;   A0 ( )          A0 (Indeterminate)
;   A1 ( )          A1 (Indeterminate)
;   Stack amount used: None
;   Notes:
;=====
;   .SECTION  PROGRAM,CODE
;   .ORG     VromTOP                    ; ROM area
;   .SB     Vsb                          ; Declares SB register value
;   .SBSYM   ANS
LDC     #Vsb,SB
;
;
MOV.W   #0,R0                          ; Initializes calculation area
MOV.W   #3,R3                          ; Sets number of sum-of-products
MOV.W   #DATA11,A0                      ; Multiplicand address
MOV.W   #DATA21,A1                      ; Multiplier address
RMPA.B                               ; Executes sum-of-products calculation
MOV.W   R0,ANS                          ; Sets calculation result
;
;
        .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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