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April 1st, 2010
Renesas Electronics Corporation

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M16C/64 Group

Operation of Timer A (event counter mode, reload type)

1. Abstract

In event counter mode, choose functions from those listed in Table 1. Operations of the circled items are described below.

2. Introduction

This application note is applied to the M16C/64 group microcomputers.

This program can be operated under the condition of M16C family products with the same SFR (Special Function Register) as M16C/64 Group products. Because some functions may be modified of the M16C family products, see the user's manual. When using the functions shown in this application note, evaluate them carefully for an operation.

3. Chosen functions

Table 1. Chosen functions

Item	Set-up	
Count source	<input type="radio"/>	Input signal to TAIiN (counting falling edges)
	<input type="radio"/>	Input signal to TAIiN (counting rising edges)
	<input type="radio"/>	Timer overflow (TB2/TAj overflow)
Pulse output function	<input type="radio"/>	No pulses output
	<input type="radio"/>	Pulses output
Count operation type	<input type="radio"/>	Reload type
	<input type="radio"/>	Free-run type

Note: $j = i - 1$, but $j = 4$ when $i = 0$.

4. Operation

- (1) Setting the count start flag to “1” causes the counter to count the falling edges of the count source.
- (2) If an underflow occurs, the content of the reload register is reloaded to the counter, and the count continues. At this time, the timer Ai interrupt request bit goes to “1”.
- (3) If switching from an up count to a down count or vice versa while a count is in progress, the switch takes effect from the next effective edge of the count source.
- (4) Setting the count start flag to “0” causes the counter to stop and to hold its value.
- (5) If an overflow occurs, the content of the reload register is reloaded to the counter, and the count continues. At this time, the timer Ai interrupt request bit goes to “1”.

Figure 1 shows the operation timing.

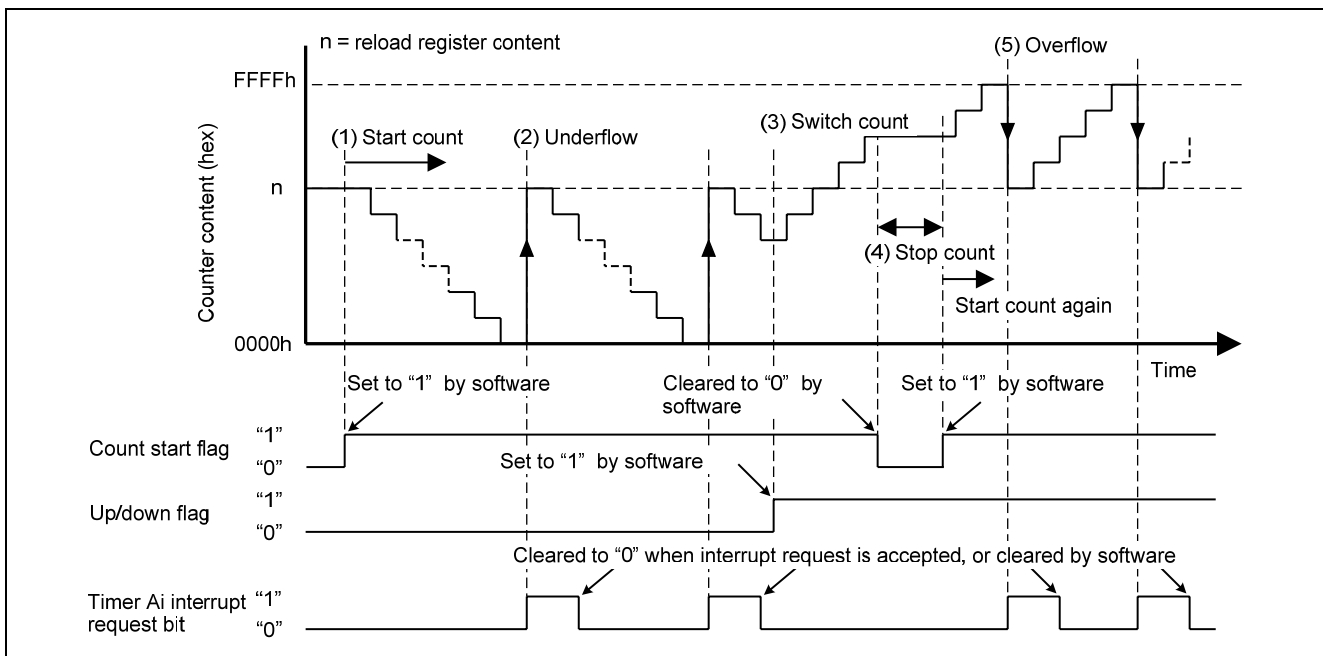
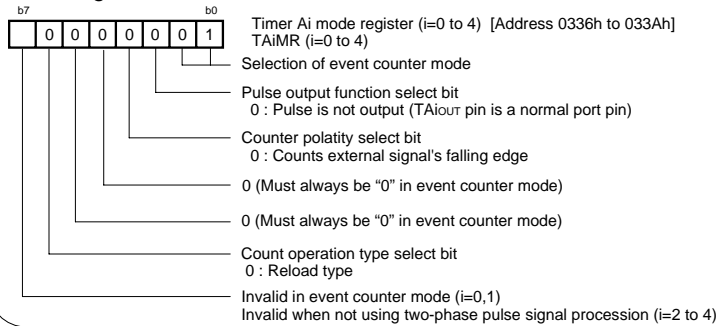


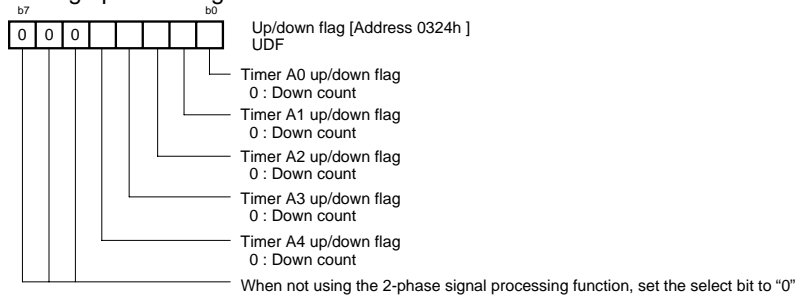
Figure 1. Operation timing of event counter mode, reload type selected

5. Set-up procedure

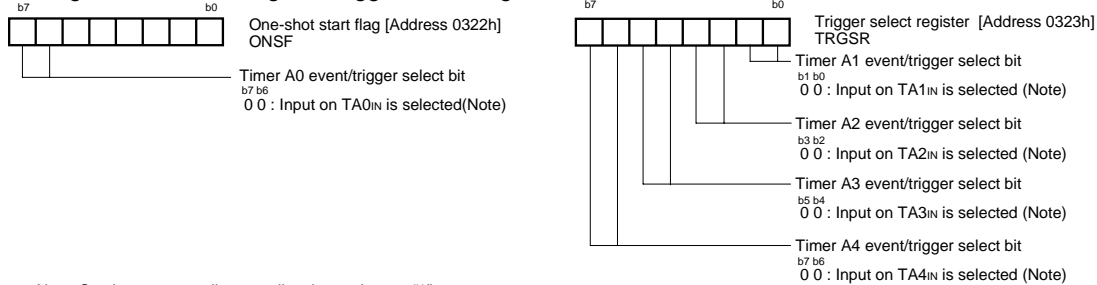
Selecting event counter mode and functions



Setting up/down flag

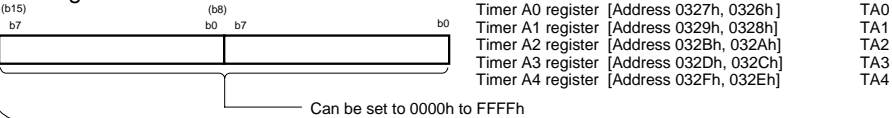


Setting one-shot start flag and trigger select register

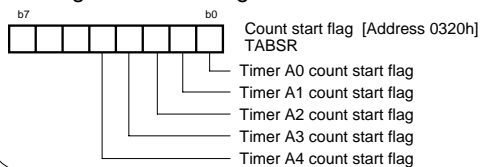


Note: Set the corresponding port direction register to "0"

Setting counter value



Setting count start flag



Start count

6. Reference

Hardware manual

M16C/64 Group Hardware Manual

(Use the most recent version of the document on the Renesas Technology Web site.)

Technical news/Technical update

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Revision

Rev.	Issue date	Revised	
		Page	Point
1.00	2008.06	-	First edition issued

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