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April 1st, 2010
Renesas Electronics Corporation

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38C2 Group

Timer 3 Operation (Timer Mode: Piezoelectric Buzzer Output)

1. Abstract

The following article introduces and shows an example of how to use the Timer 3 Operation (Timer Mode: Piezoelectric Buzzer Output) on the 38C2 group device.

2. Introduction

The explanation of this issue is applied to the following condition:

Applicable MCU: 38C2 Group

Oscillation frequency: 8MHz

In this sample program, the bit of the function which is not used may be operated on account of bit arrangement of SFR. Please set these setting values according to the use situation of a user system.

3. Contents

3.1 Piezoelectric Buzzer Output

Outline: A piezoelectric buzzer output in the timer mode of timer 3.

Specifications:

- The rectangular waveform, dividing the clock $f(XIN)=8MHz$ into about 2kHz, is output from the P52/T3OUT pin.
- The output level of the P52/T3OUT pin is fixed to “H” while a piezoelectric buzzer output stops.

Figure 3.1 shows the Output Waveform and Peripheral Circuit Example; Figure 3.2 shows the Timers Connection and Division Ratios; Figure 3.3 shows the Relevant Registers Setting; Figure 3.4 shows the Control Procedure.

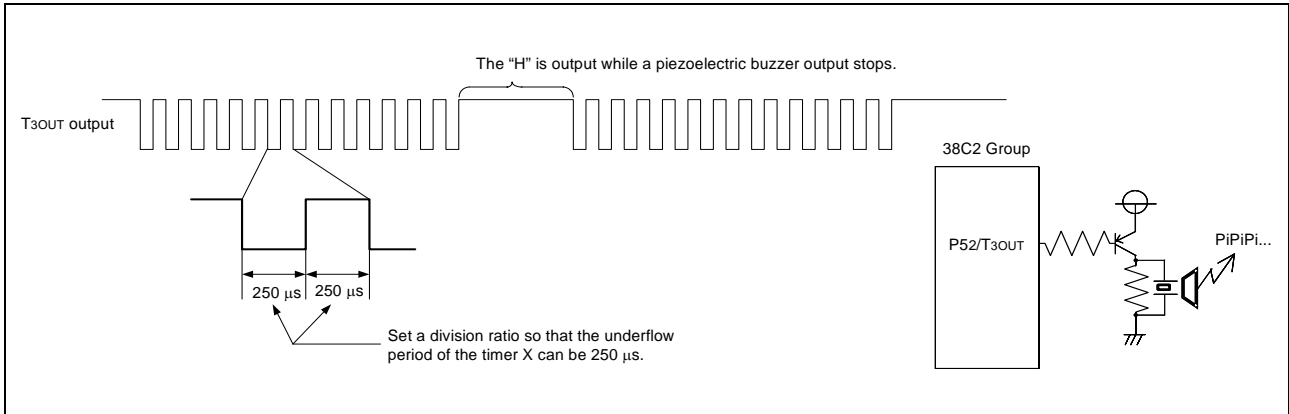


Figure 3.1 Output Waveform and Peripheral Circuit Example

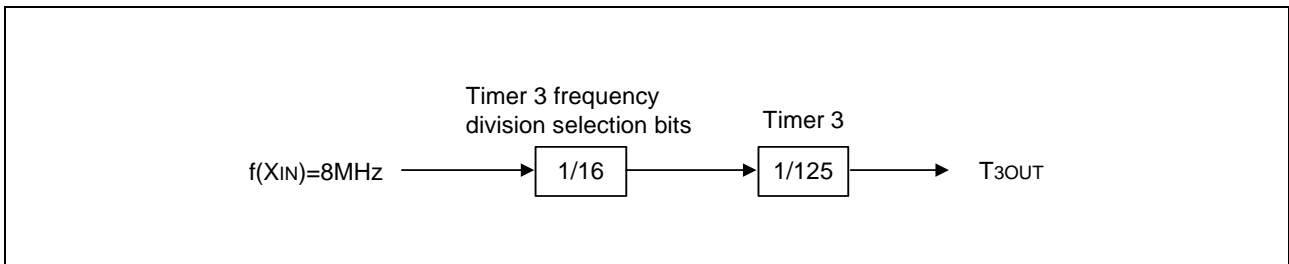


Figure 3.2 Timers Connection and Division Ratios

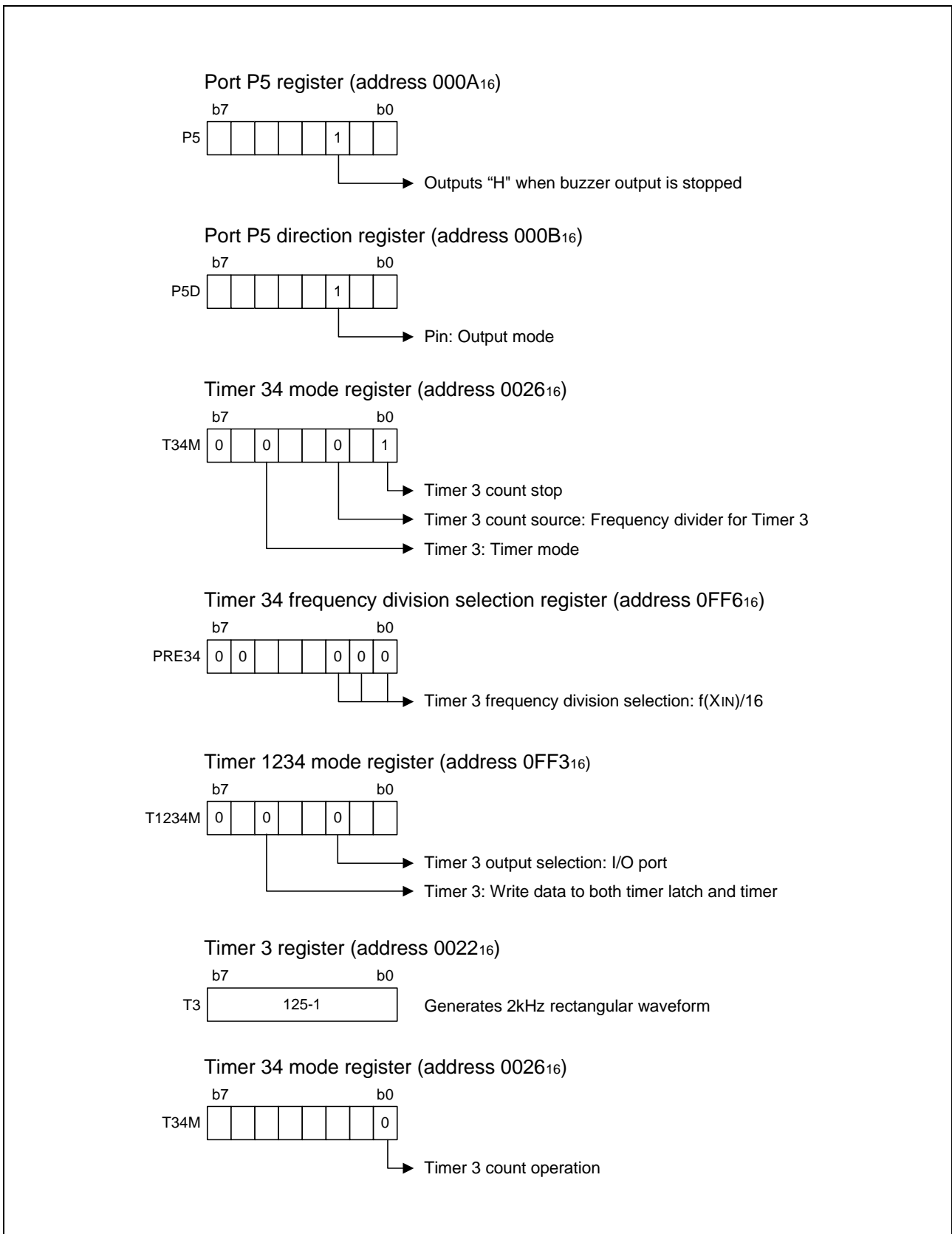


Figure 3.3 Relevant Registers Setting

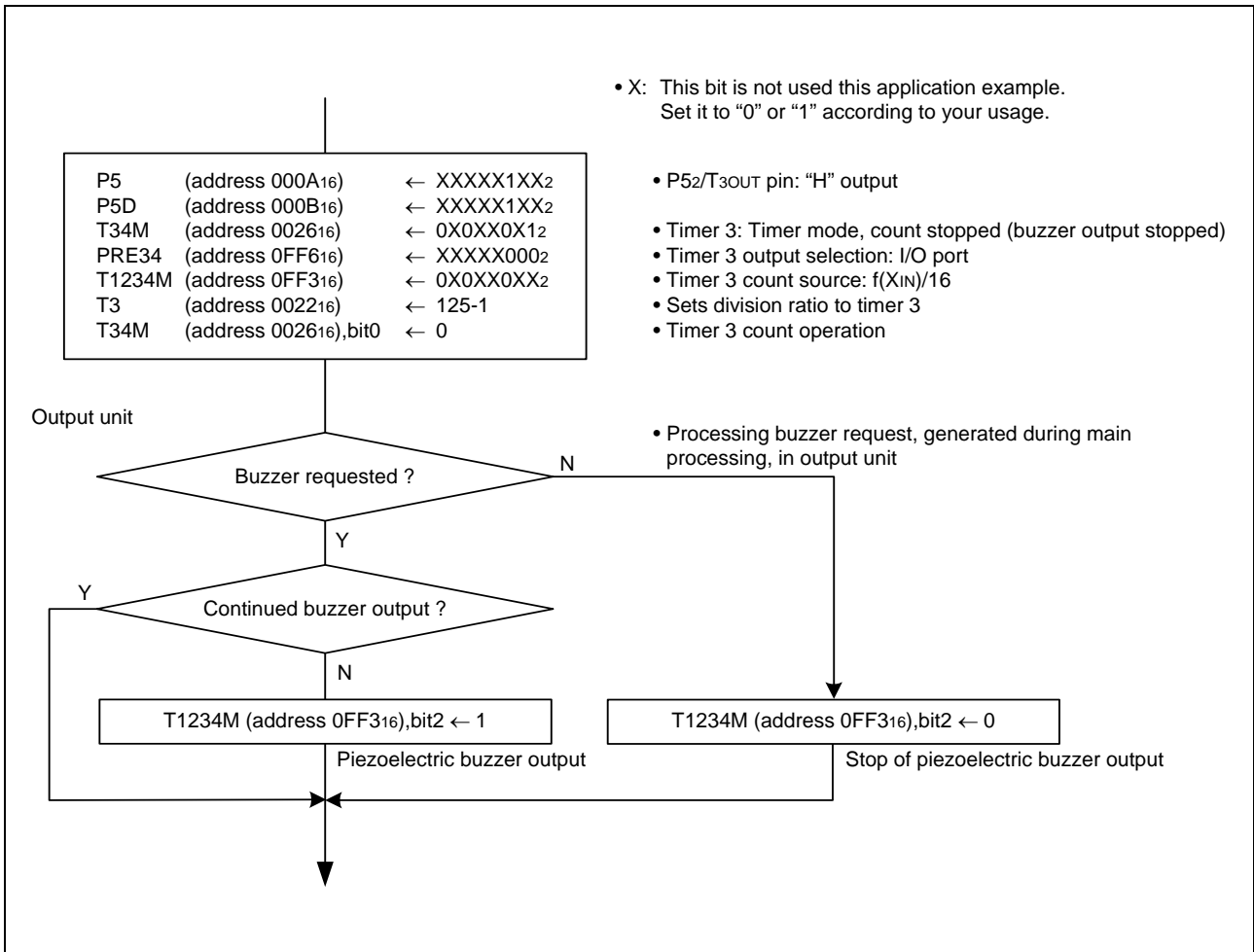


Figure 3.4 Control Procedure

4. Sample Programming Code

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[Setting of control register]
  LDM  #%00000100,P5      ;Set Port P5 register
  LDM  #%00000100,P5D    ;Set Port P5 direction register
;
  LDM  #%01000001,T34M   ;Set Timer 34 mode register
  LDA  #%00000000        ;Set Timer 34 frequency division selection
  STA  PRE34
  LDA  #%00000000        ;Set Timer 1234 mode register
  STA  T1234M
  LDM  #125-1,T3         ;Set Timer 3
  CLB  0,T34M            ;Timer 3 start

[Main routine]
__MAIN:
  BBC  R_BUZZER,STOP_buzzer ;>>no
  BBS  F_BUZZER,__MAIN      ;>>yes
;
  LDA  #%00000100        ;Set Timer 1234 mode register
  STA  T1234M
  BRA  __MAIN
;
STOP_buzzer:
  LDA  #%00000000,T1234M
  LDA  #%00000100        ;Set Timer T1234M mode register
  STA  T1234M
  BRA  __MAIN

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5. Reference

Renesas Technology Corporation Semiconductor Home Page
<http://www.renesas.com>

E-mail Support
E-mail: support_apl@renesas.com

Data Sheet
38C2 Group (A version) Data sheet
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REVISION HISTORY	38C2 Group Timer 3 Operation (Timer Mode: Piezoelectric Buzzer Output)
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Rev.	Date	Description	
		Page	Summary
1.00	Sep 25, 2004	-	First Edition issued

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