

To our customers,

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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## 38D2 Group

### Timer 2 Operation (Timer Mode: Piezoelectric Buzzer Output)

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#### 1. Abstract

The following article introduces and shows an example of how to use Timer 2 Operation (Timer Mode: Piezoelectric Buzzer Output) on the 38D2 Group device.

#### 2. Introduction

The application explained in this document applies to the following MCU and parameter(s):

Applicable MCU: 38D2 Group

Oscillation frequency: 8 MHz

This sample program may include operations of unused bit functions for the convenience of the SFR bit layout. Set the values according to the operational conditions of the user system.

### 3. Contents

#### 3.1 Piezoelectric Buzzer Output

Outline: A piezoelectric buzzer is output using the timer 2 timer mode.

Specifications:

- The square wave, which is the clock  $f(XIN) = 8\text{ MHz}$  divided by 2 MHz is output from P36/T2OUT pin.
- Output level of P36/T2OUT pin is fixed to "H" while a piezoelectric buzzer output is stopped.

Figure 3.1 shows the Output Waveform and Peripheral Circuit Example, Figure 3.2 shows the Connection Diagram and Division Ratios, Figure 3.3 shows the Relevant Register Settings, and Figure 3.4 shows the Control Procedure.

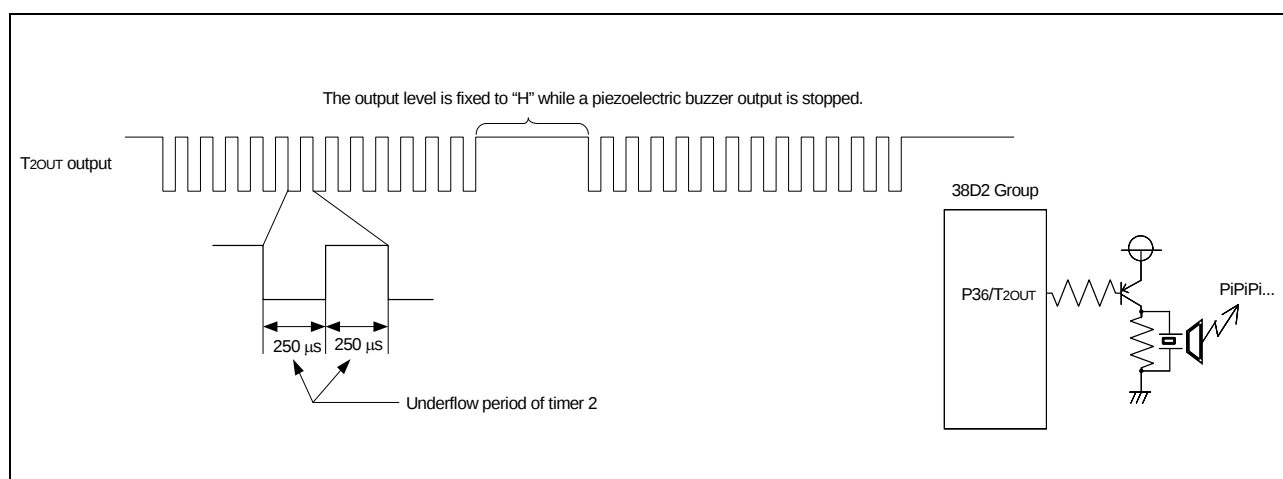


Figure 3.1 Output Waveform and Peripheral Circuit Example

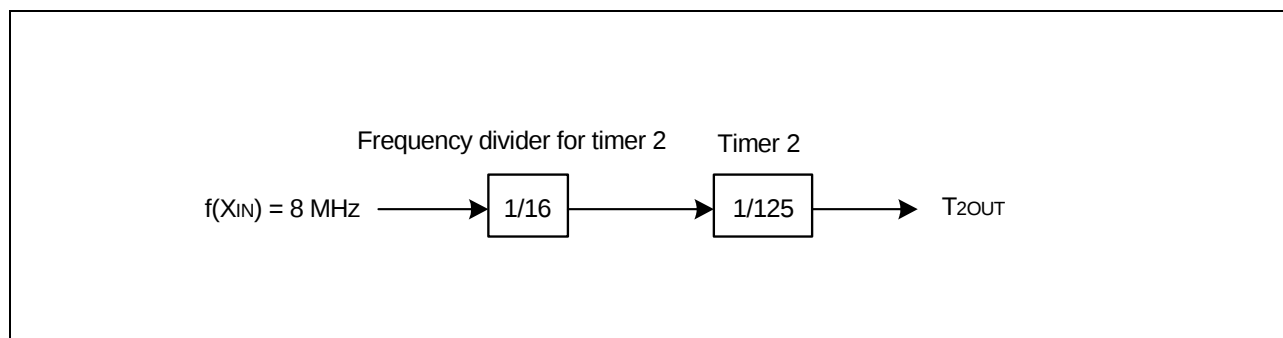


Figure 3.2 Connection Diagram and Division Ratios

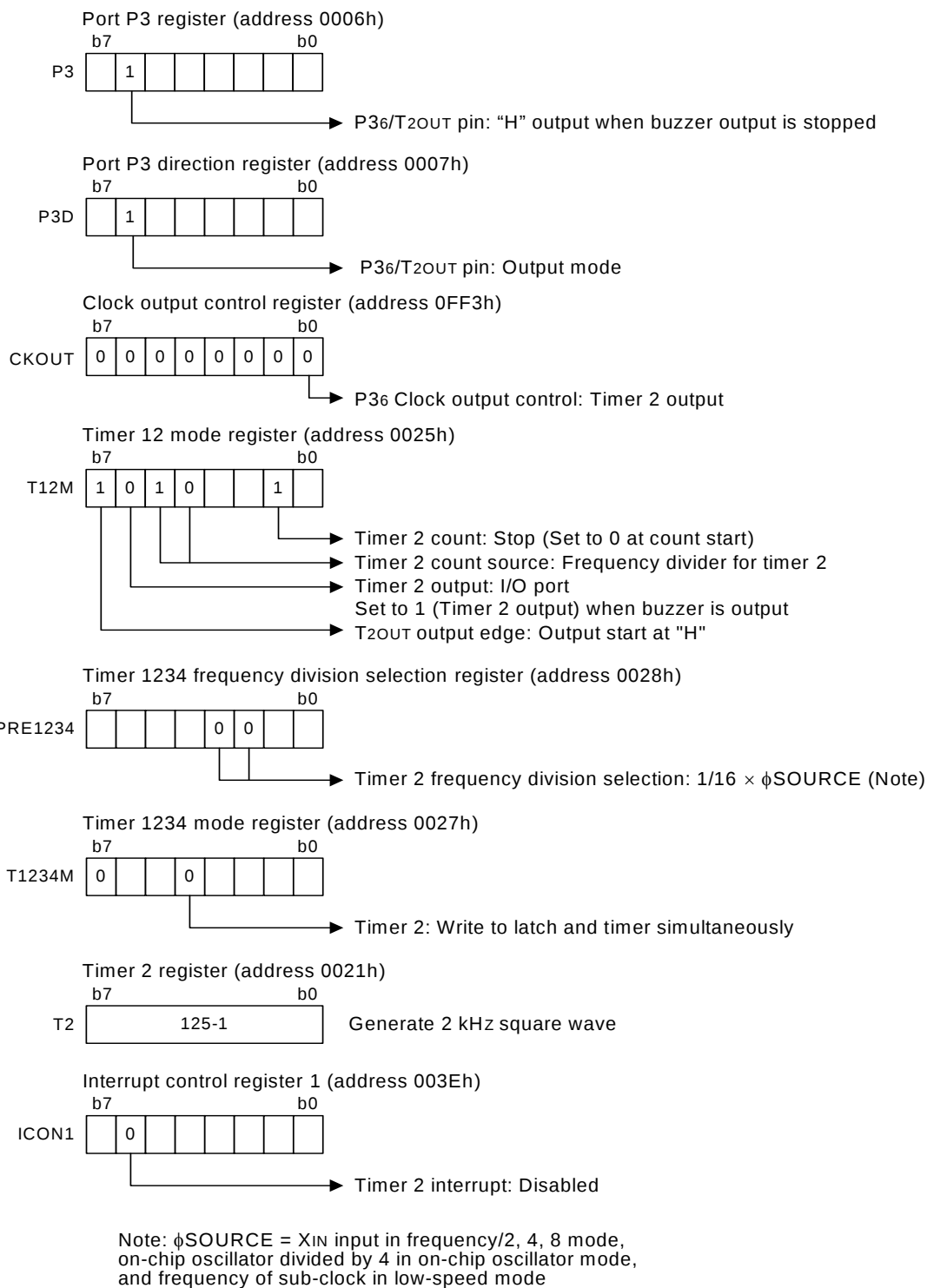


Figure 3.3 Relevant Register Settings

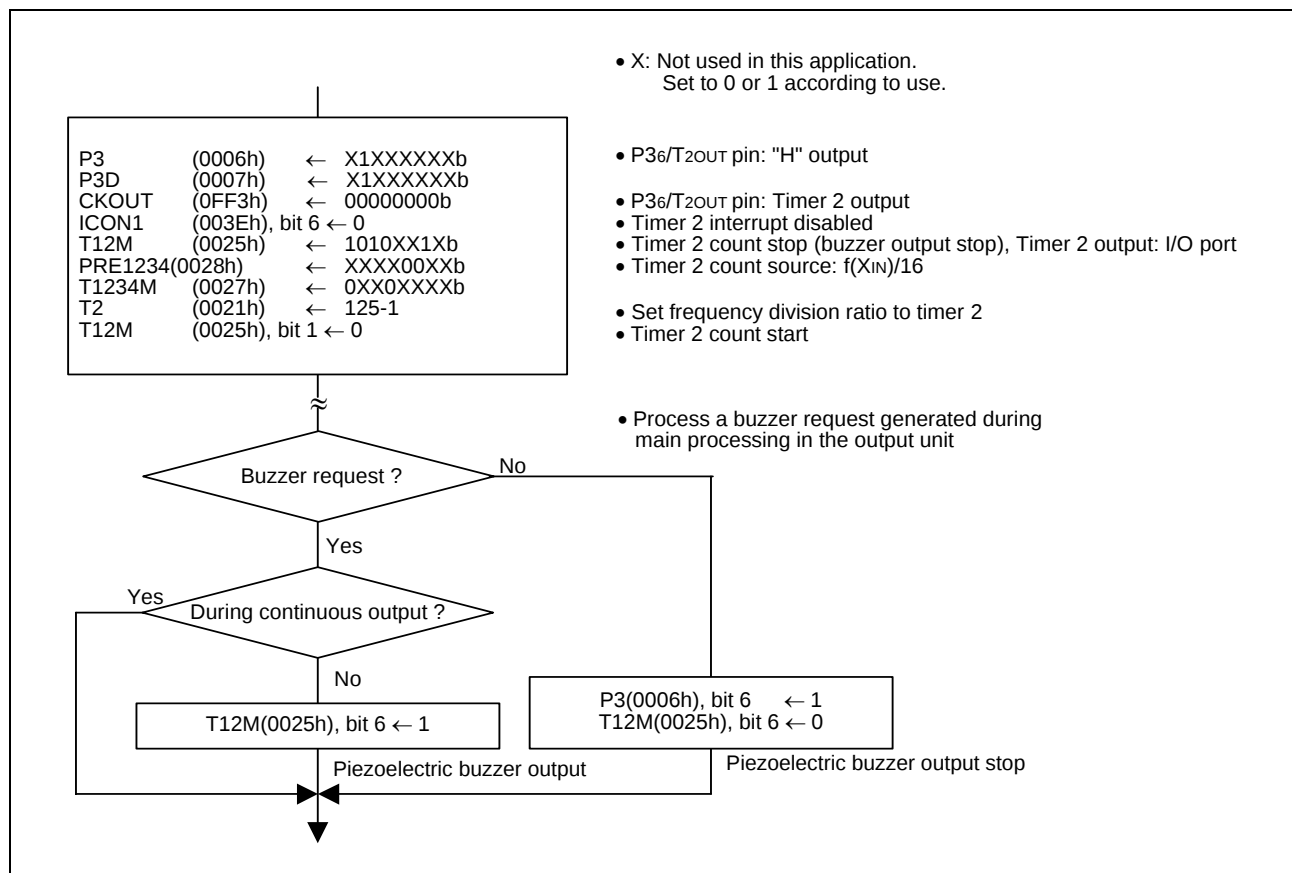


Figure 3.4 Control Procedure

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#### 4. Sample Programming Code

Download a sample program from the Renesas Technology website.

To download, click "Application Notes" in the left side menu on the page of the 38D2 Group.

#### 5. Reference Document

Datasheet

38D2 Group Datasheet

Download the latest version from the Renesas Technology website.

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