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April 1st, 2010
Renesas Electronics Corporation

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38D2 Group

Timer X Operation (Event Counter Mode: Frequency Measurement)

1. Abstract

The following article introduces and shows an example of Timer X Operation (Event Counter Mode: Frequency Measurement) 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 Frequency Measurement

Outline:

- The number of pulses input to P37/CNTR0 pin is counted in timer X event counter mode.
- Calculate the frequency from the number of pulses in 2 ms.
- A valid input pulse is in the 10 to 20 kHz (20 to 40 pulses) frequency range.

Specifications:

- Clock $f(XIN) = 8\text{ MHz}$ is divided with timers 1 and 2, and the timer X count value is read with the timer 2 interrupt which generates 2 ms intervals.
- Timer X is counted down from the initial value of 255 and initialized at every timer 2 interrupt.
- The valid frequencies for the timer X count are 235 to 215.

Figure 3.1 shows the Determination Method of Valid/Invalid of Input Pulses, Figure 3.2 shows the Relevant Register Settings, and Figure 3.3 shows the Control Procedure.

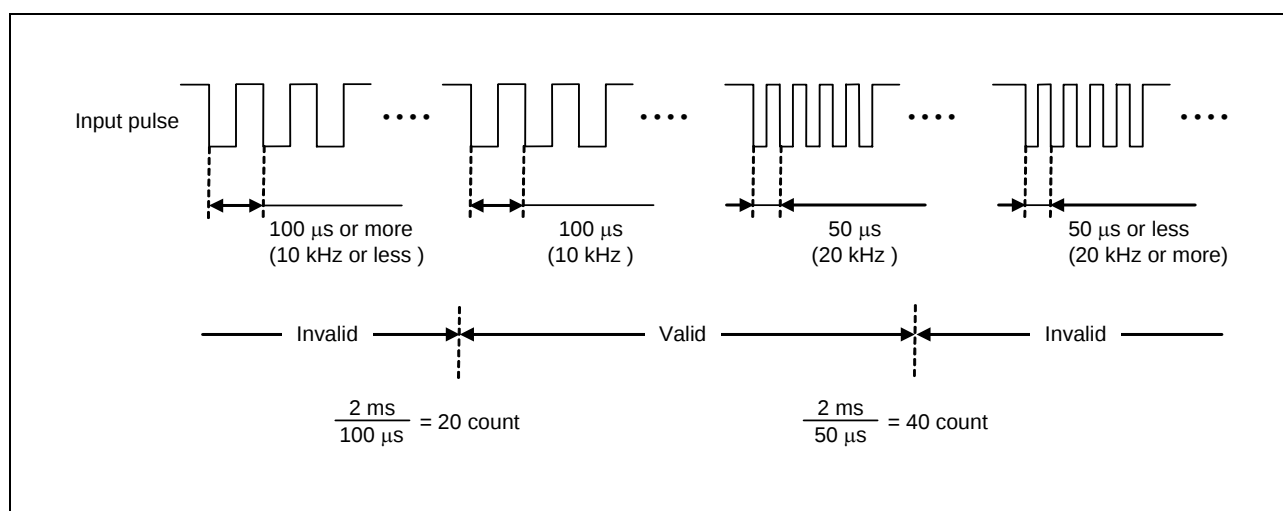


Figure 3.1 Determination Method of Valid/Invalid of Input Pulses

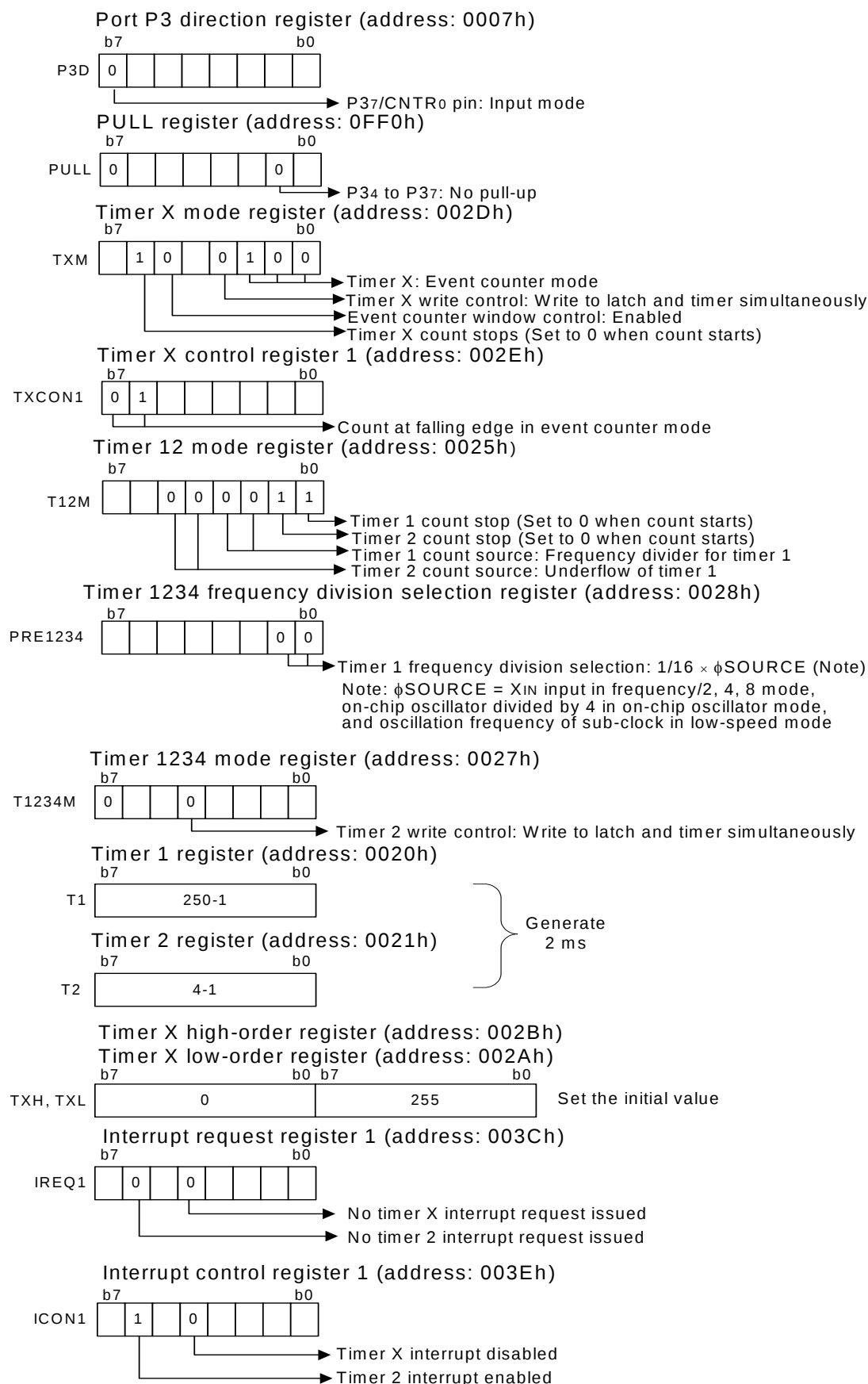


Figure 3.2 Relevant Register Settings

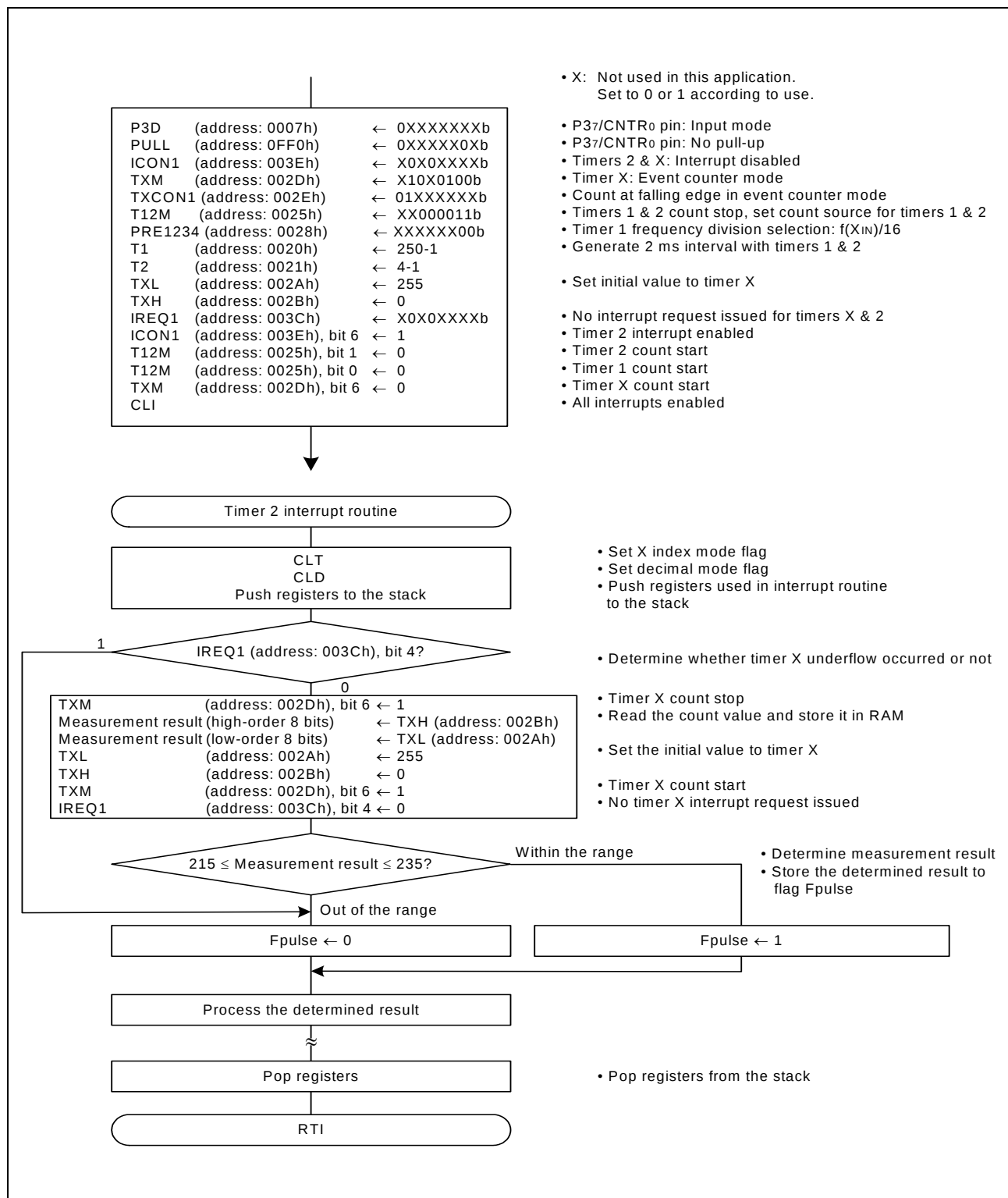


Figure 3.3 Control Procedure

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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REVISION HISTORY	38D2 Group Timer X Operation (Event Counter Mode: Frequency Measurement)
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		Page	Summary
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