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April 1st, 2010
Renesas Electronics Corporation

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38D5 Group

Serial I/O 1 (Clock Synchronous Serial I/O Mode: Example 1)

1. Abstract

The following article introduces and shows an example of how to use the Serial I/O 1 (Clock Synchronous Serial I/O Mode: Example 1) on the 38D5 Group device.

2. Introduction

The application explained in this document applies to the following MCU and parameter(s):
Applicable MCU: 38D5 Group
Oscillation frequency: 4 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 Communication Using Clock Synchronous Serial I/O (Transmit/Receive)

Outline: 2-byte data is transmitted and received, using the clock synchronous serial I/O. SRDY signal is used for communication control.

Specifications:

- Serial I/O 1 is used (clock synchronous serial I/O mode is selected).
- Synchronous clock frequency: 125 kHz (f(XIN) = 4 MHz is divided by 32)
- SRDY signal (receivable signal) is used.
- The receiving side outputs the SRDY signal at intervals of 2 ms (generated by the timer), and 2-byte data is received.
- The transmitting side confirms the SRDY signal by INT1 interrupt request and transmits 2-byte data.

Figure 3.1 shows the Connection Diagram, Figure 3.2 shows the Timing Chart, Figure 3.3 shows the Register Settings Relevant to the Transmitting Side, Figure 3.4 shows the Register Settings Relevant to the Receiving Side, Figure 3.5 shows the Control Procedure of Transmitting Side, and Figure 3.6 shows the Control Procedure of Receiving Side.

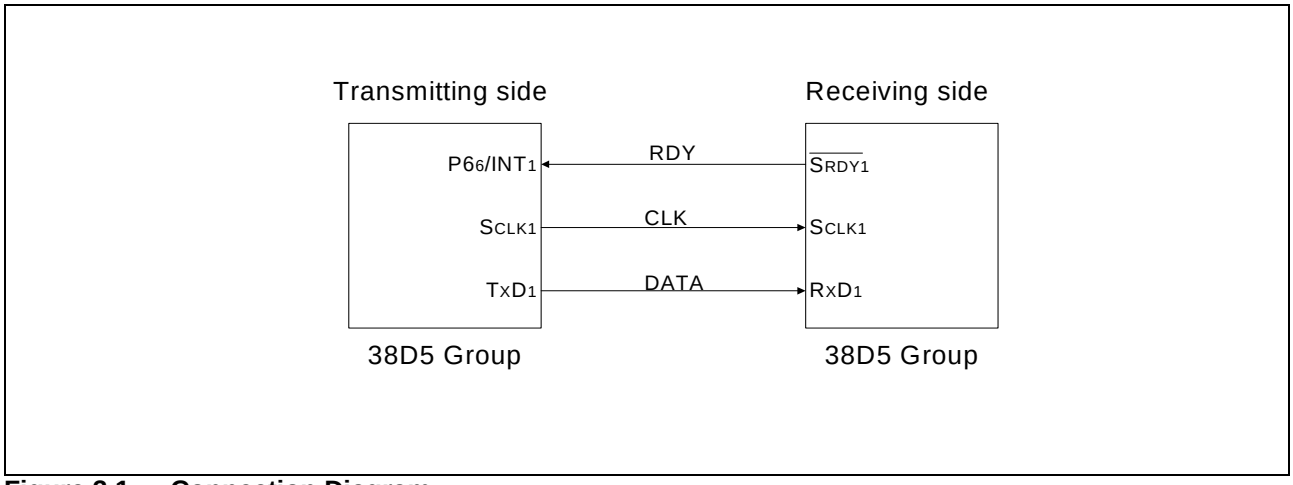


Figure 3.1 Connection Diagram

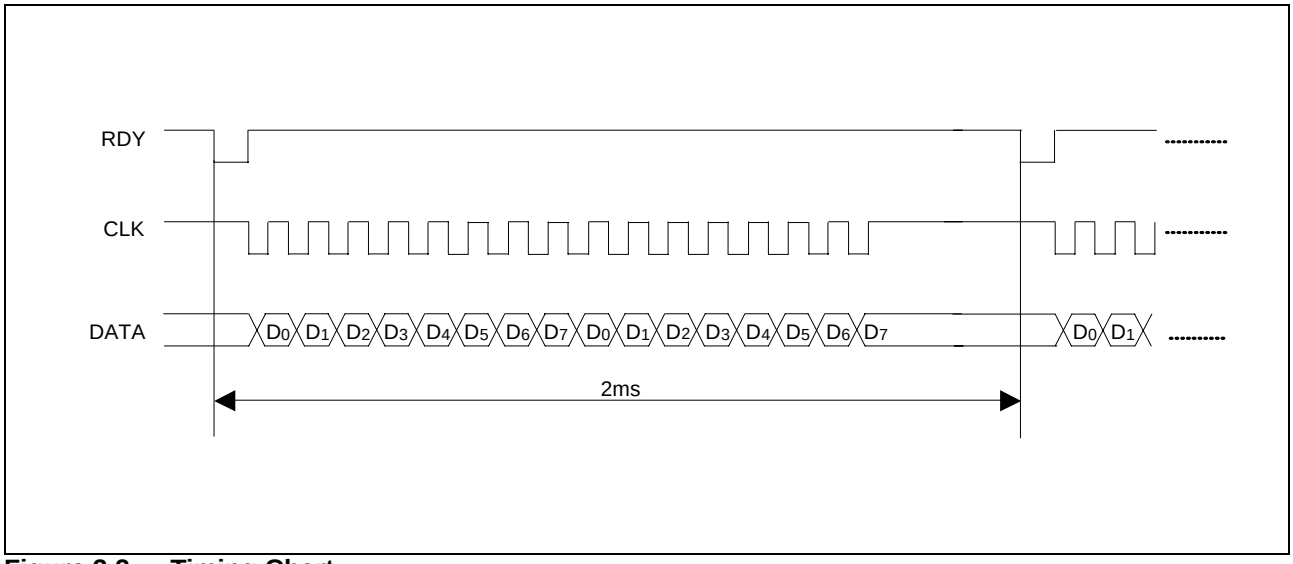
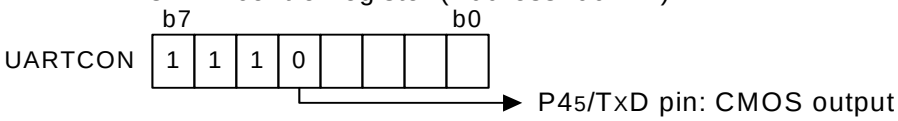


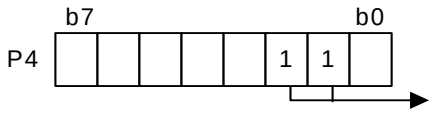
Figure 3.2 Timing Chart

Transmitting side

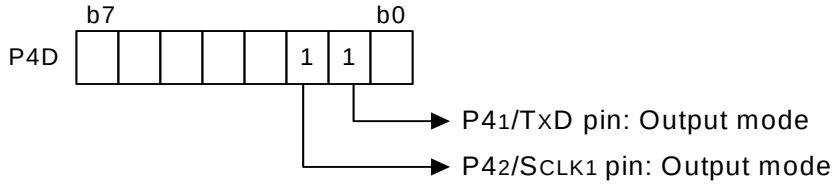
UART control register (Address: 001Bh)



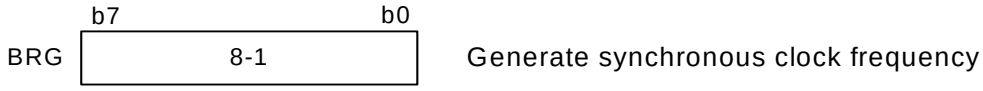
Port P4 register (Address: 0008h)



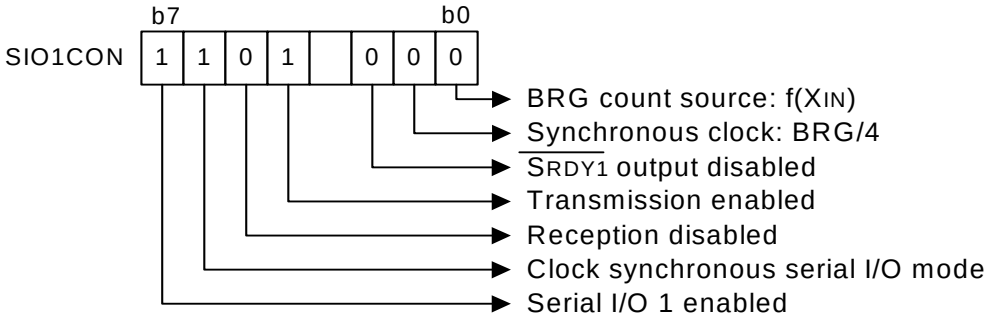
Port P4 direction register (Address: 0009h)



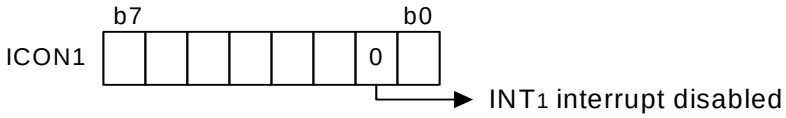
Baud rate generator (Address: 001Ch)



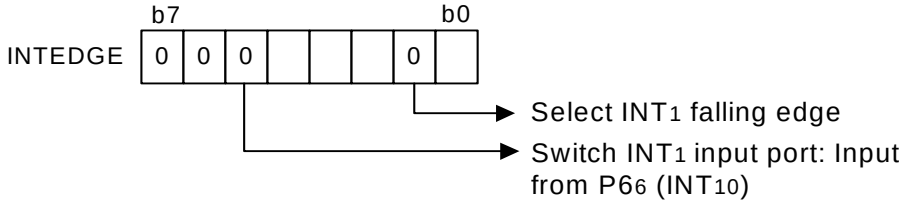
Serial I/O 1 control register (Address: 001Ah)



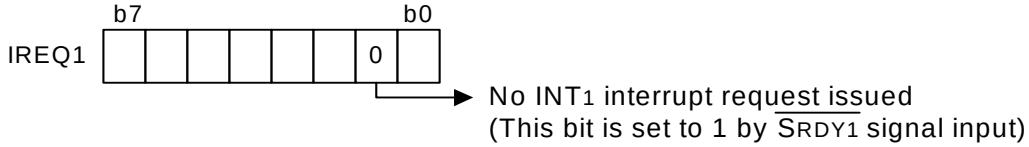
Interrupt control register 1 (Address: 003Eh)



Interrupt edge selection register (Address: 003Ah)



Interrupt request register 1 (Address: 003Ch)



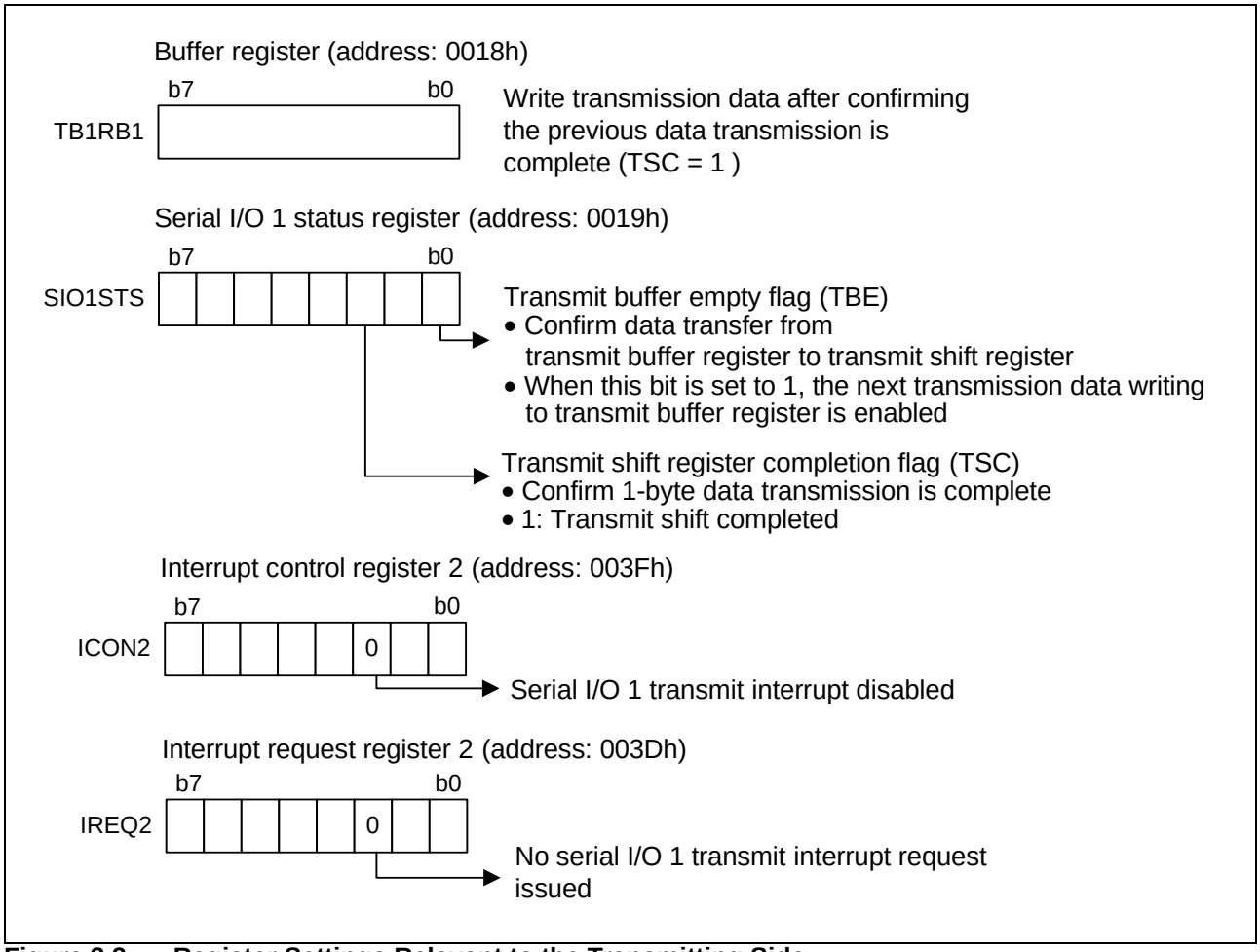


Figure 3.3 Register Settings Relevant to the Transmitting Side

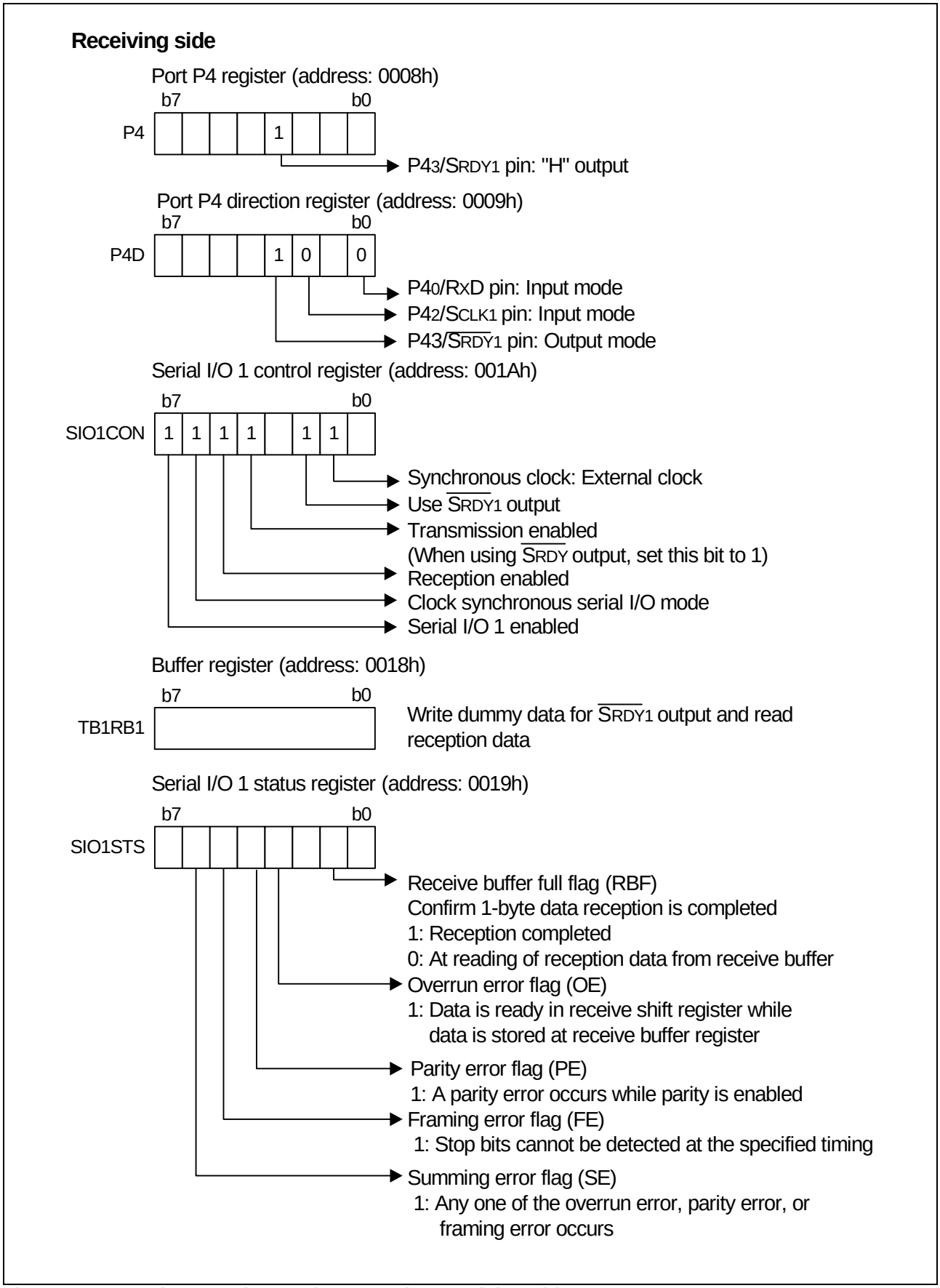


Figure 3.4 Register Settings Relevant to the Receiving Side

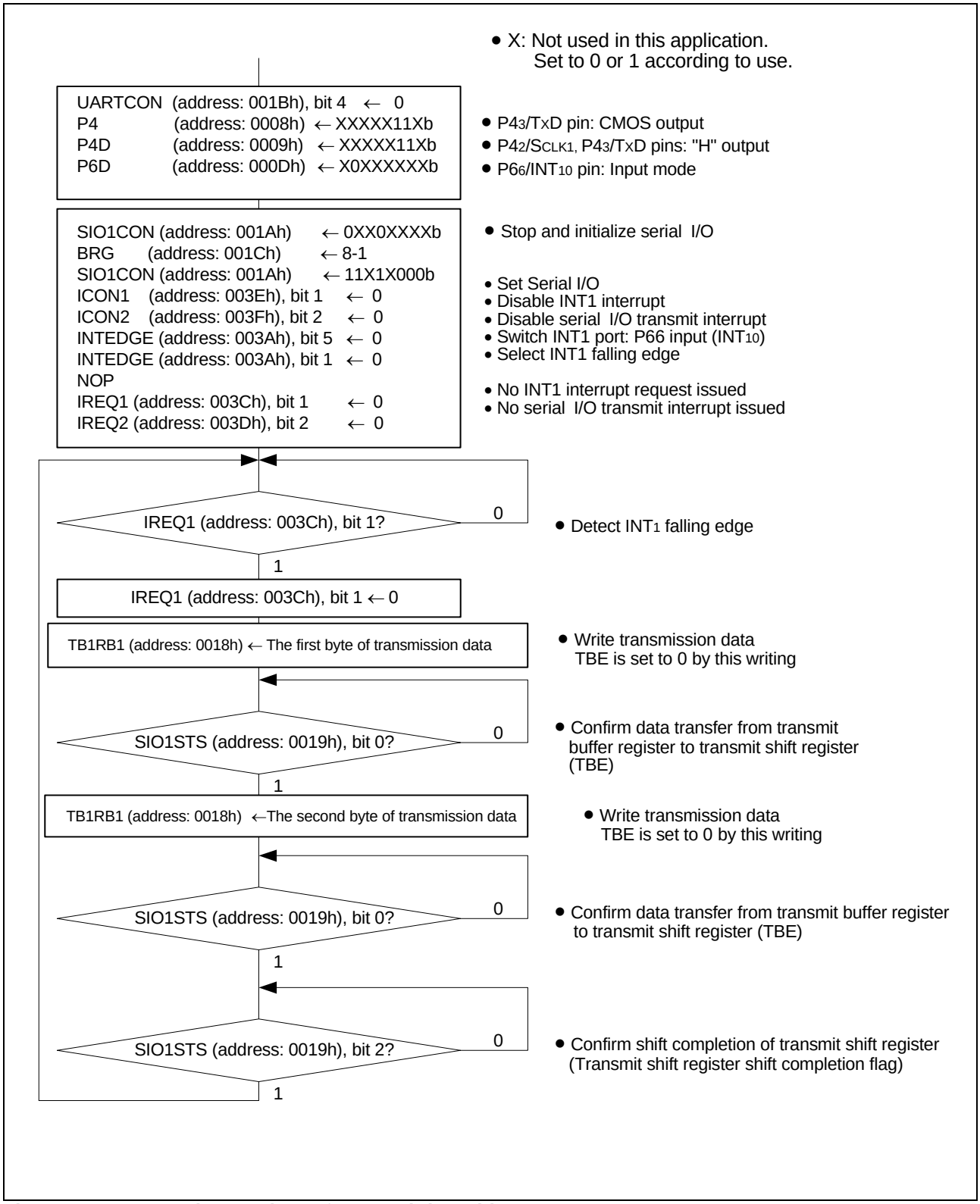


Figure 3.5 Control Procedure of Transmitting Side

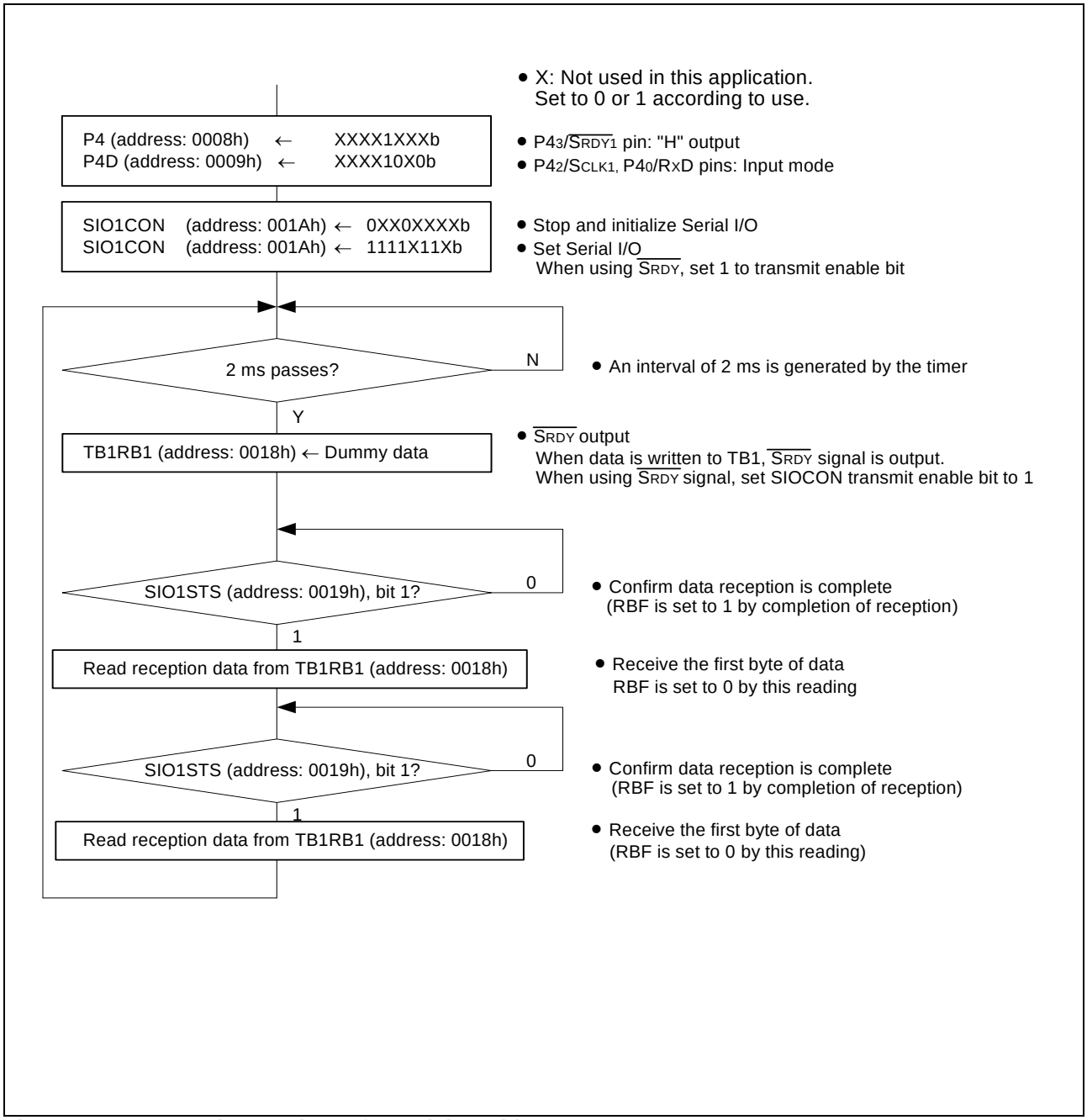


Figure 3.6 Control Procedure of Receiving Side

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 38D5 Group.

5. Reference Document

Datasheet
38D5 Group Datasheet
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REVISION HISTORY	38D5 Group Serial I/O 1 (Clock Synchronous Serial I/O Mode: Example 1)

Rev.	Date	Description	
		Page	Summary
1.00	Sep 15, 2006	–	First Edition issued

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